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JANUARY 26, 1935

Railway Age

FOUNDED IN 1856

TIMKEN

PROGRESS REPORT TO THE RAILROADS

67% of all steam and electric locomotives built during 1934 were completely equipped with roller bearings on all driving and other axles

97% of all of these roller bearing equipped locomotives were completely TIMKEN-equipped on all driving and other axles

75% of all steam and electric locomotives built during 1934 were partially or completely equipped with roller bearing journals

98% of all of these partially or completely equipped roller bearing locomotives built in 1934 were TIMKEN-equipped

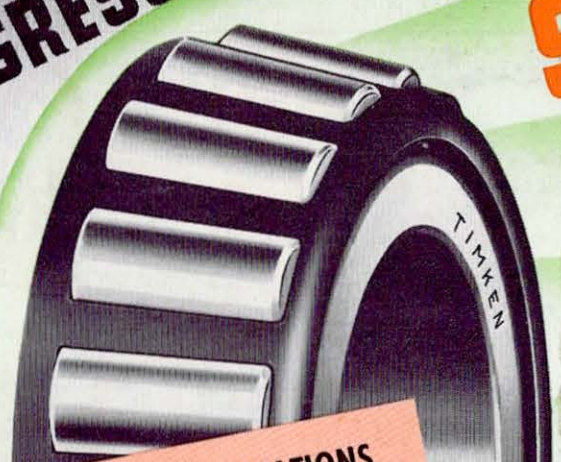
100% of all streamlined trains purchased in 1934 are to be roller bearing equipped on all journals

75% of the streamlined trains purchased during 1934 are to be completely TIMKEN-equipped on all journals

71% of all roller bearing equipped passenger cars built during 1934 were completely Timken-equipped on all journals

The first streamlined steam locomotive (New York Central) is Timken-equipped on all driving axles, engine truck and tender

MADE IN U. S. A.



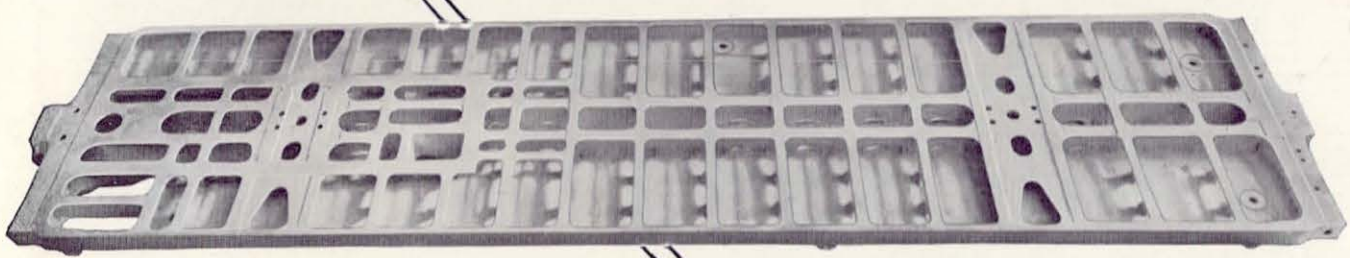
OUTSTANDING TIMKEN APPLICATIONS for 1934 are as follows:

Northern Pacific	10	Steam locomotives, all axles, all tenders
Lackawanna	18	Steam locomotives, all axles
Pennsylvania	30	Electric locomotives, all axles
Burlington	1	Steam locomotive and tender, all axles, except trailer
Lehigh Valley	2	Steam locomotives, all axles, all tenders
Lehigh Valley	3	Steam locomotives, all engine trucks
New York Central	33	Tenders, all axles
Boston & Maine	10	Steam locomotives, all engine trucks
Milwaukee Road	50	Deluxe coaches, all axles
Milwaukee Road	25	Baggage cars, all axles
Burlington	2	3-car "Zephyr" streamlined trains, all axles
New Haven	1	3-car streamlined train, all axles
Gulf, Mobile & Northern	2	4-car streamlined trains, all axles
Baltimore & Ohio	1	8-car streamlined steam train, all axles
Boston & Maine	2	Diesel-electric coaches, all axles
South Manchurian Railways	6	4-car streamlined trains
South Manchurian Railways	11	Steam locomotive tenders, all axles
Grand Trunk	4	Engine trucks, all axles
B. M. T. Subway	1	5-car articulated train, all axles
Norfolk and Southern	2	Self-propelled coaches, all axles
Uruguayan State Railways	4	Self-propelled coaches, all axles
Pennsylvania	1	Steam locomotive and tender, all axle and rod bearings

THE TIMKEN ROLLER BEARING COMPANY
CANTON, OHIO

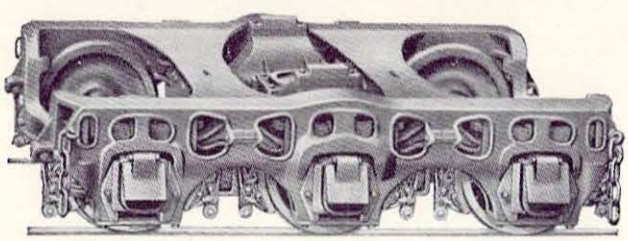
COMMONWEALTH
WATER-BOTTOM
TENDER FRAMES

PROVED EQUIPMENT *for* LOCOMOTIVE TENDERS



OVER 2000 WATER-BOTTOM TYPE TENDER FRAMES IN SERVICE
WITH TENDER CAPACITIES FROM 7000 TO 25,000 GALLONS

ASSURE: Lower Center of Gravity—Additional Water and Fuel
Capacity Without Increasing Size of Tender
Minimum Weight—Maximum Strength



DEVELOPED THROUGH 20 YEARS OF SERVICE
OVER 5000 IN OPERATION ON 55 RAILROADS

COMMONWEALTH
EQUALIZED SWING-MOTION
TENDER TRUCKS

Coil-Elliptic Spring Arrangement Absorbs Road Shocks, Prevents Spring Synchronism—Swing Motion Arrangement Prevents Tender Derailments, Assures Smooth Riding

GENERAL STEEL CASTINGS CORPORATION

COMMONWEALTH PRODUCTS

EDDYSTONE, PA. GRANITE CITY, ILL.

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

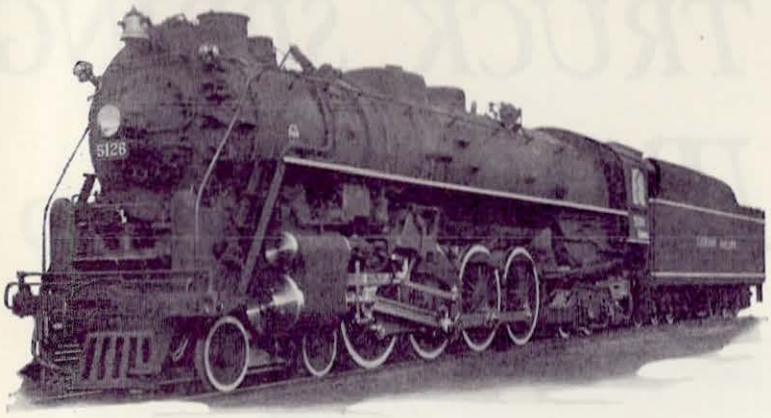
MINER TRUCK SPRING SNUBBERS LEAD

IN THEIR ABILITY TO PREVENT VERTICAL OSCILLATION AND IN PROTECTING FREIGHT CARS AND LADING AGAINST THE DESTRUCTIVE EFFECTS OF BOUNCING

MINER SNUBBERS do their work well under all conditions of main line service—high speeds, out-of-round wheels and unyielding roadbeds. They prevent injury to lading located directly over the trucks as effectively as in the center of the car. They are the practical solution of the car stabilization problem because they do not require any change in the standard truck spring arrangement. They do not increase weight of car and their first cost is reasonable.

MINER SNUBBERS are an investment in economy that will bring sure and substantial returns.

W. H. MINER, INC., CHICAGO



One of the Five Modern 4-8-4 Type Locomotives now Being Completed in the Baldwin Shops for the Lehigh Valley Railroad

NEW POWER BUILT IN 1934

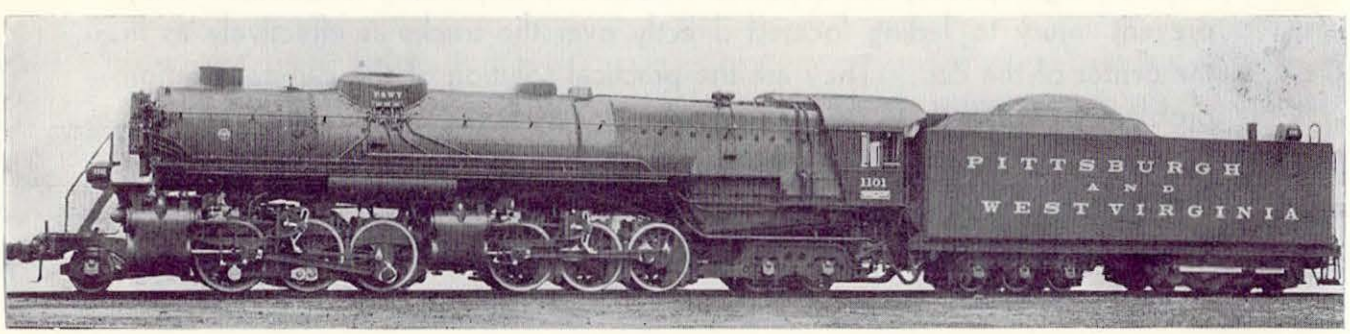
On these pages are depicted some of the modern locomotives which have been added to railroad inventories during the past year.

All of this power—whether steam, electric or internal combustion—reflects the great advancement made in locomotive design and manufacture during the past decade.

A modern locomotive is not simply another new locomotive. It is a superior motive power unit. As compared with older power, it gives greater hauling capacity, more dependable service and substantial economy in operation and maintenance.

Modern Locomotives give lower operating costs!

THE BALDWIN



A Modern Baldwin Locomotive of the Single-expansion, Articulated Type; One of Three Locomotives Recently Delivered to the Pittsburgh and West Virginia Railway

One of the Ten Modern Baldwin Locomotives, of the 4-8-4 Type, Recently Built for the Northern Pacific Railway

Better railroad earnings in the years to come—

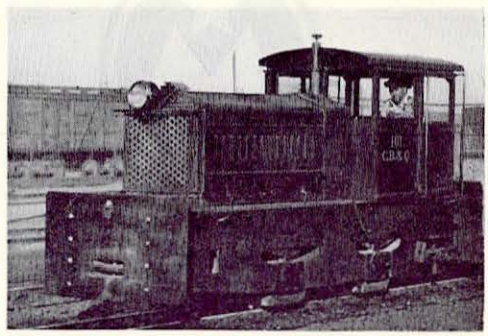
will result from the use of modern power purchased now. For example, note the economic advantages of modern steam locomotives as compared with older power.

I. With the same weight on drivers they can haul twice the tonnage at speeds of 30 miles per hour and over, or the same tonnage at much higher average speeds.

II. Fuel and water rates per unit of work are substantially reduced.

III. Repair costs are lower on new power.

These advantages will enhance the competitive ability of the railroads and help to regain lost traffic.



Whitcomb 13-ton, Gasoline-mechanical Locomotive Used by the Chicago, Burlington & Quincy at Their Tie and Timber Preserving Plant

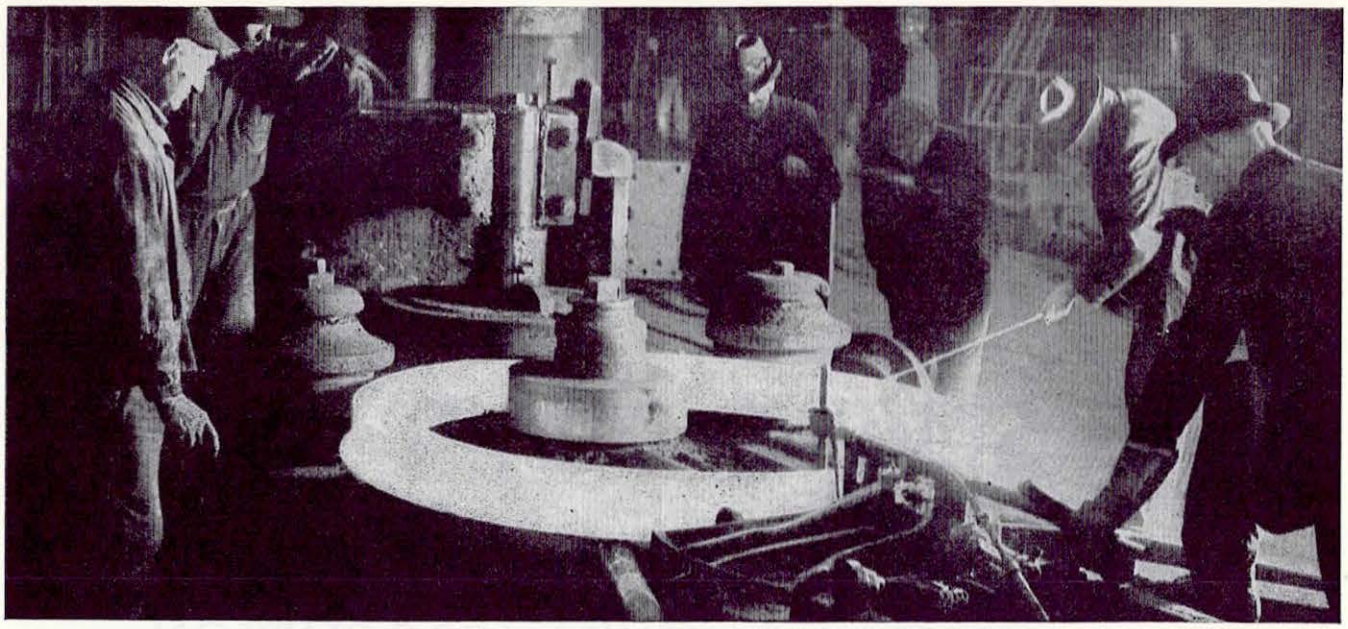
Lower operating costs give better earnings!

LOCOMOTIVE WORKS
PHILADELPHIA

Electric Locomotive for Passenger Service. The Pennsylvania Railroad has Recently Ordered 57 Duplicate Locomotives, the Chassis for 25 of which will be Built by Baldwin

S T

by M I D



E E L

The railroads' construction, expansion and maintenance have been made possible by just one material—Steel. Neither the railroad nor steel, without the assistance of the other, would otherwise be as highly developed and useful as each of them is—today.

Midvale and the railroad are both pioneers in this country's earlier expansion—and are both fundamental in realizing its present day's greatest possibilities.

Midvale steel is today required for literally thousands of varying purposes and conditions, in practically every type of industry. But Midvale believes no greater responsibility is required and met—than in the steel furnished by Midvale to the railroads. As a consequence, in buying Midvale steel you are buying not merely so many pounds of steel—but rather so many years of experience and skill, plus so many years of dependable future service.

THE MIDVALE COMPANY • NICETOWN, PHILADELPHIA

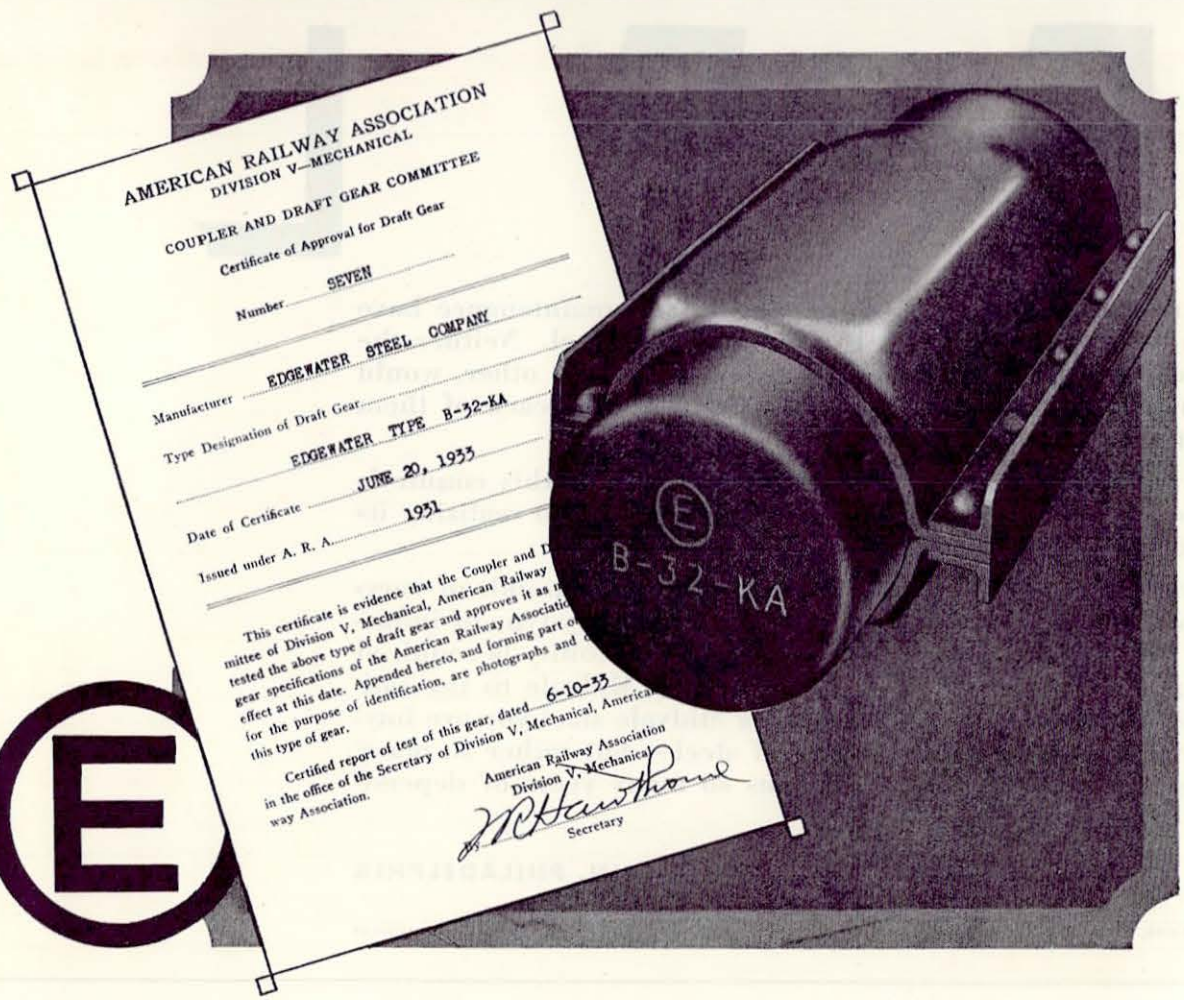
District Offices:

New York Pittsburgh Washington Cleveland Chicago San Francisco

V A L E

The EDGEWATER RING SPRING DRAFT GEAR

Awarded Certificate of Approval by the AMERICAN RAILWAY ASSOCIATION

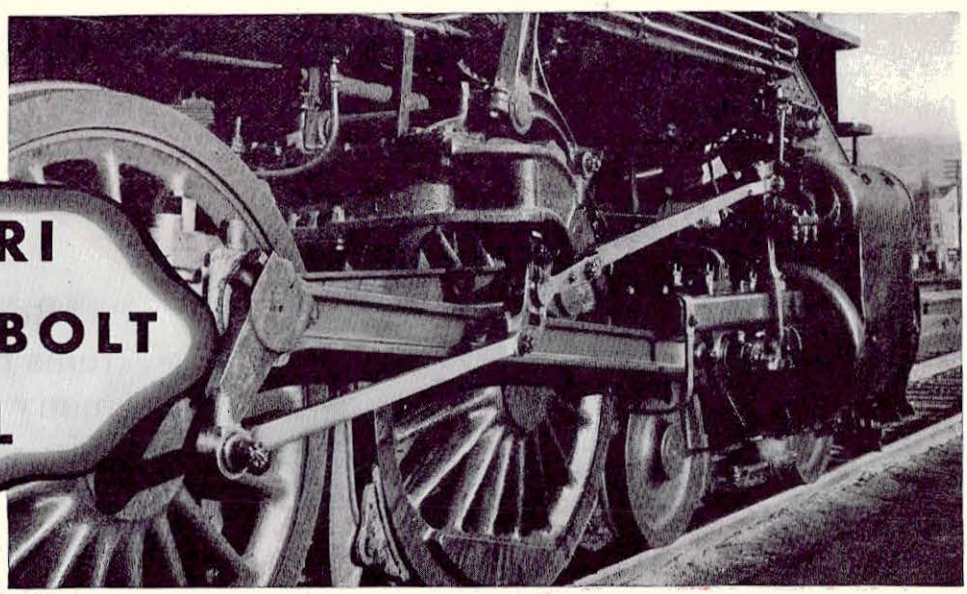

AMERICAN RAILWAY ASSOCIATION
DIVISION V—MECHANICAL
COUPLER AND DRAFT GEAR COMMITTEE
Certificate of Approval for Draft Gear
Number SEVEN
Manufacturer EDGEWATER STEEL COMPANY
Type Designation of Draft Gear
EDGEWATER TYPE B-32-KA
Date of Certificate JUNE 20, 1933
Issued under A. R. A. 1931
This certificate is evidence that the Coupler and D
mittee of Division V, Mechanical, American Railway
tested the above type of draft gear and approves it as
gear specifications of the American Railway Associati
effect at this date. Appended hereto, and forming part o
for the purpose of identification, are photographs and
this type of gear.
Certified report of test of this gear, dated 6-10-33
in the office of the Secretary of Division V, Mechanical, America
way Association.
American Railway Association
Division V, Mechanical
Secretary
B-32-KA

EDGEWATER STEEL COMPANY

PITTSBURGH PENNSYLVANIA

Atlanta	Boston	Kansas City	New York	Portland
Baltimore	Chicago	Louisville	Philadelphia	San Francisco
St. Louis	Seattle	St. Paul	Washington	

for Bolts and Pins



in Modern Motive Power

THE fast operation of big locomotives with heavy reciprocating parts sets up stresses that demand the superior strength and other properties of Mayari Engine Bolt Steel.

Mayari Engine Bolt Steel combines much higher physicals with the dependability of materials formerly in general use. Used on well-known railroads over a considerable period, Mayari Engine Bolt Steel has clearly shown ability to measure up to the engine-bolt requirements of modern motive power.

No heat-treatment is needed to prepare Mayari Engine Bolt Steel for heavy service. Use it as received. There's no chance for error in treatment. No costly equipment is needed.

A GENERAL-PURPOSE STEEL

FOR valve-motion pins and other parts that are case-hardened for resistance to wear, Mayari Engine Bolt Steel is unsurpassed. It's an all-purpose engine-bolt material, filling practically every need for steel bar stock around locomotives.

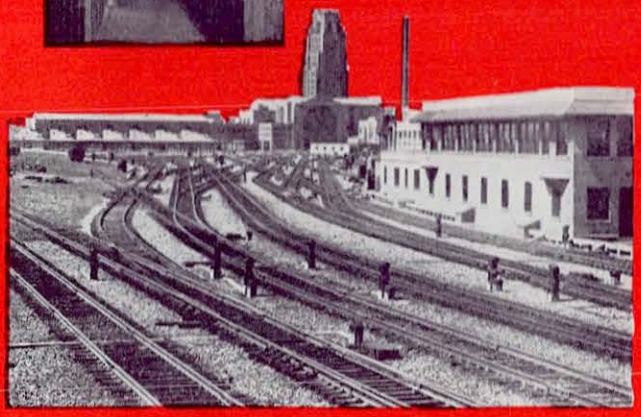
It eliminates the need for stocking three or four grades, with the possibility of mixing steels. It has a rare combination of general utility and excellent qualifications for specific tasks.

BETHLEHEM STEEL

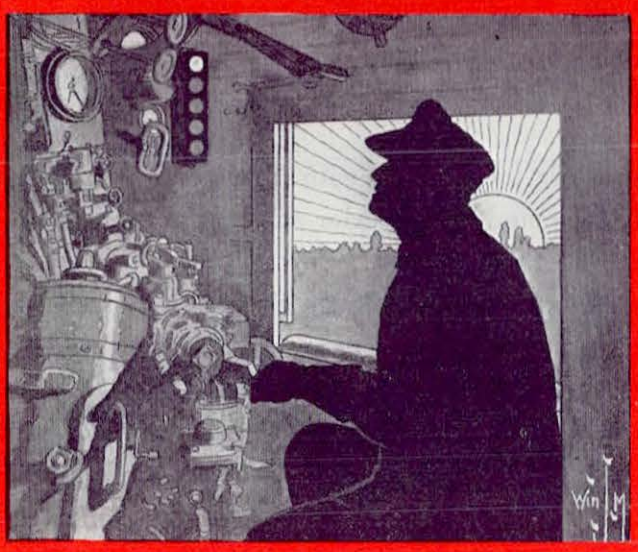
BETHLEHEM STEEL COMPANY

General Offices: Bethlehem, Pa. *District Offices:* Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corporation, San Francisco, Seattle, Los Angeles, Portland, Honolulu. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

SELF-LIQUIDATING



ELECTRIC INTERLOCKING



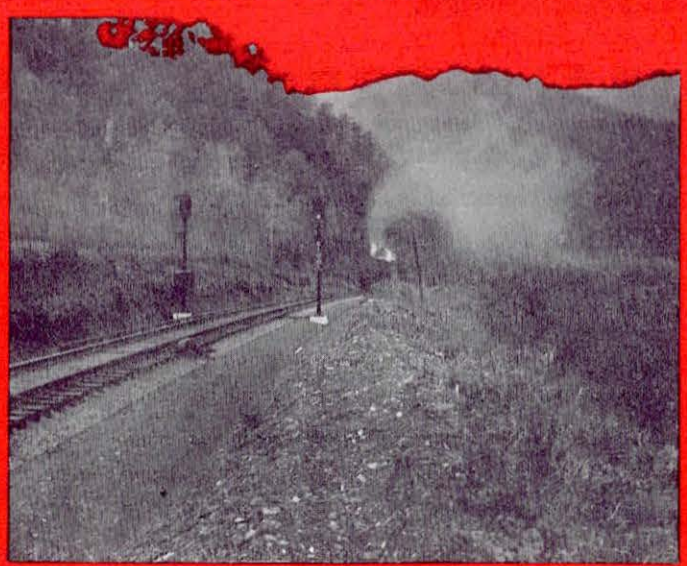
CAB SIGNALS

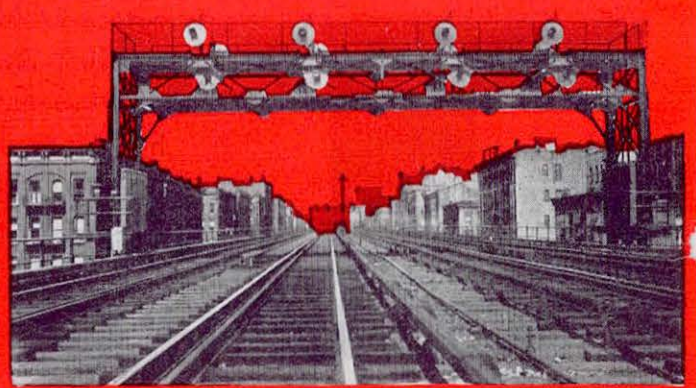
Because G-R-S Signal Systems reduce delays, eliminate many train stops, help maintain difficult schedules, increase track capacity, promote safety, lower train-mile costs and effect a more economical operation, they pay for themselves rapidly. They are, therefore, self-liquidating.

Furthermore, they are designed for the high-speed passenger and heavy-tonnage traffic of the future.

GENERAL RAILWAY

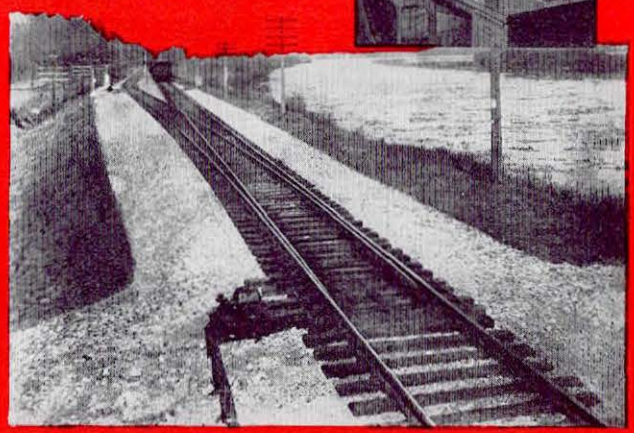
New York Chicago ROCHESTER,
Montreal London Paris Tokyo Madrid





AUTOMATIC BLOCK SIGNALS INCLUDING A. P. B. FOR SINGLE TRACK

SIGNAL SYSTEMS



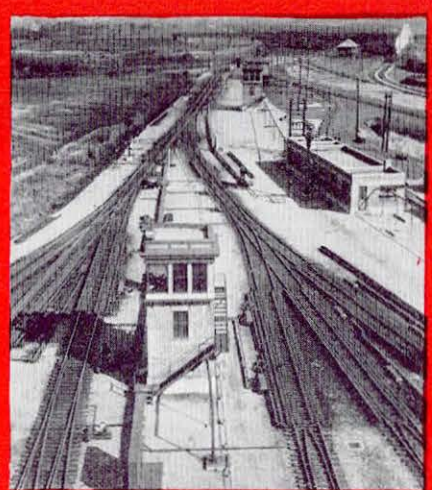
REMOTE CONTROL

Installations of these systems have shown returns on investments ranging from 16 to 115 per cent. There are thousands of G-R-S signal installations in operation throughout the world.

If you desire to lower your train- or ton-mile costs and to improve train schedules, ask our nearest office for proposals on suitable combinations of these systems to meet your traffic requirements.

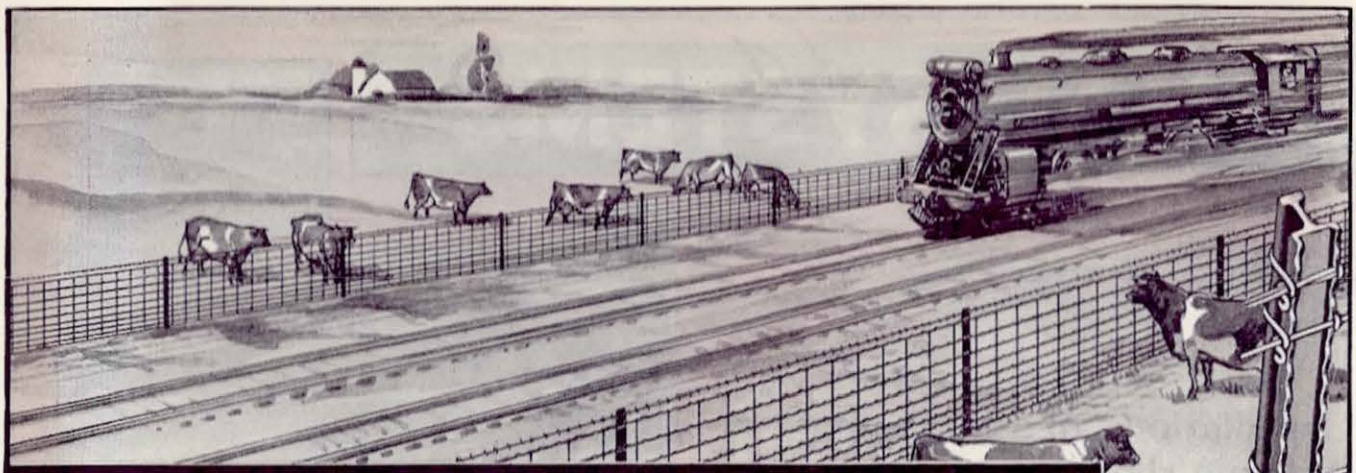
SIGNAL COMPANY

NEW YORK St. Louis A-1205
Melbourne Calcutta Buenos Aires

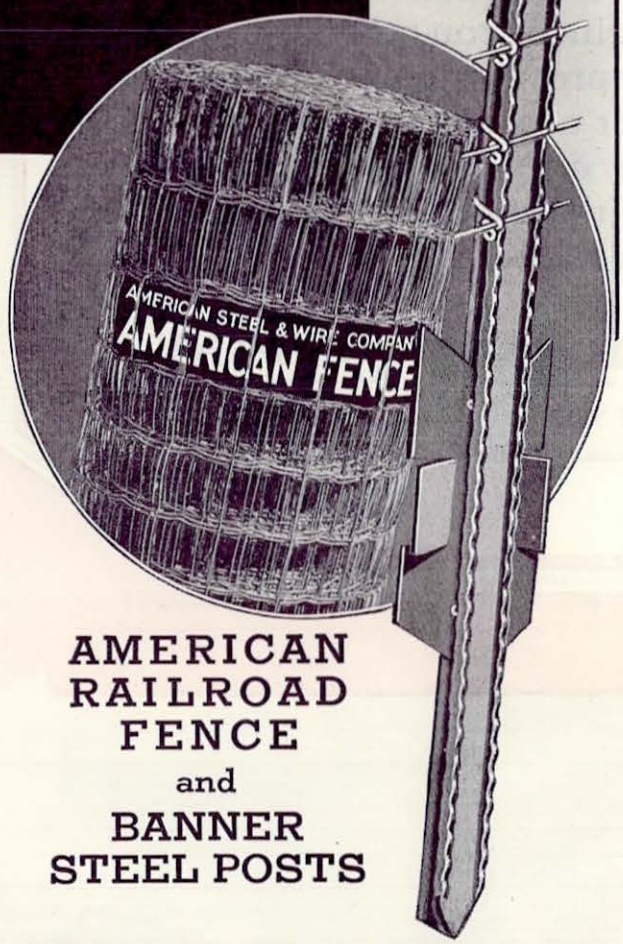


CAR RETARDERS

CENTRALIZED TRAFFIC CONTROL



MILES OF FENCE COST LESS THAN DAMAGE SUITS



WHEN accidents happen on the right-of-way the other fellow stands a fine chance of winning any case against the railroad. And it's so often not because there was no fence but because the fence wasn't in good condition. When you build or repair, use fence known for its long years of sturdy service. Whether it's for right-of-way or use around the yards, there is no more reasonable protection figured on a cost per year basis than American Railroad Fence, Banner Steel Line Posts, and National Expanding Anchor Dirt Set End and Corner Posts which meet A. R. E. A. Specifications and assure you truly substantial long-life, low upkeep protection. When you plan, be sure you figure with us.

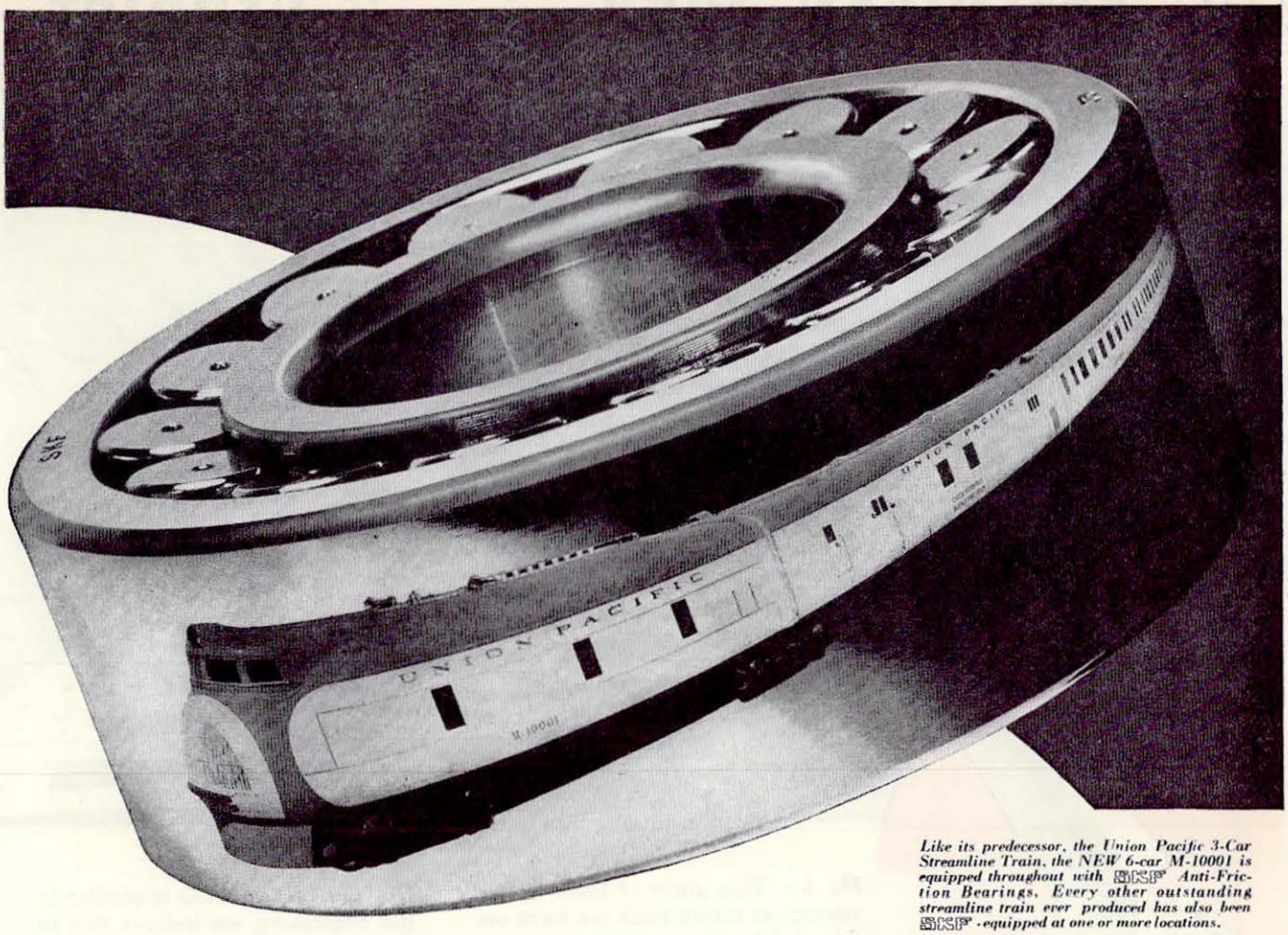
AMERICAN RAILROAD FENCE and BANNER STEEL POSTS

AMERICAN STEEL & WIRE COMPANY

208 SOUTH LA SALLE STREET • • CHICAGO

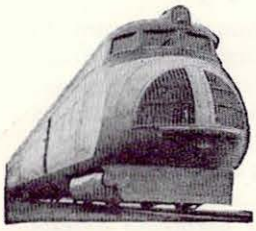
Offices in All Principal Cities

United States Steel Corporation Subsidiary



Like its predecessor, the Union Pacific 3-Car Streamline Train, the NEW 6-car M-10001 is equipped throughout with SKF Anti-Friction Bearings. Every other outstanding streamline train ever produced has also been SKF-equipped at one or more locations.

REFLECTING A RAILROAD'S FAITH IN A BEARING



A great meteor of the rails roars across the continent, rocketing its way through the miles . . . leaving old railway records in its wake . . . saving more than half a day in travel-time...giving astounded thousands along the right of way a vision of a *new* era in transportation.

But what of the bearings down in the journals, taking the tremendous loads and stresses of this hurtling metal mass? They're not new. They're the old, time-tried bearings that the world knows as SKF.

And what of the bearings on the generator that transforms the power of the giant Diesel into electrical energy . . . what of the bearings on the driving motors... the air-conditioning equipment ...the lighting generators? They're not new either. They, too, are of the same old make that have been used for years on the railroads of the world. They, too, are SKF.

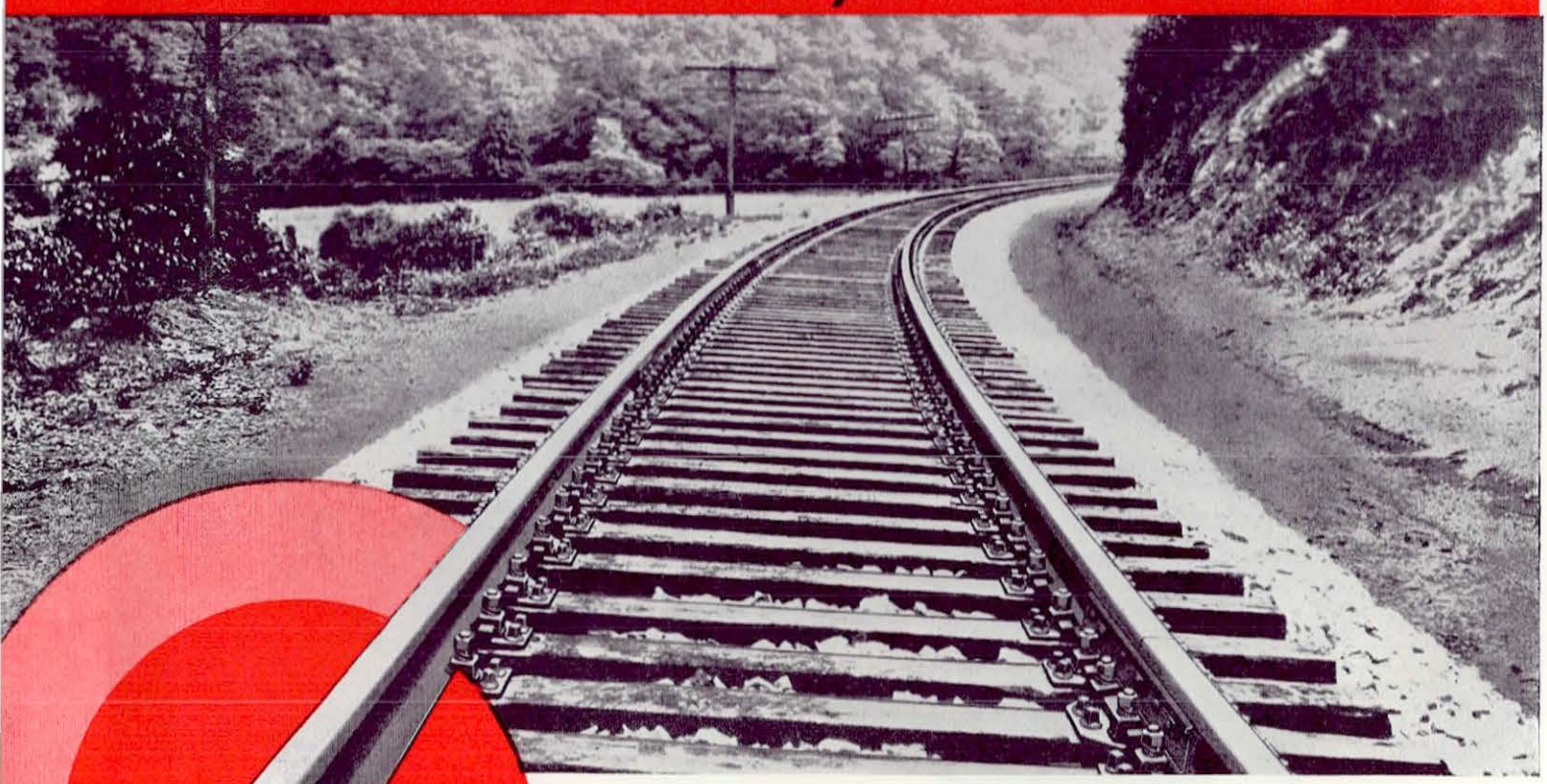
Union Pacific, the pioneer, ushers in a new railroad era . . . but places its faith in an old, old bearing. SKF makes a bearing for every purpose and always puts the *right* bearing in the *right* place. SKF INDUSTRIES, INC., Front Street and Erie Avenue, Philadelphia, Pa.

SKF

BALL AND ROLLER BEARINGS

3324

An AMERICAN JURY *gives its* VERDICT



Twelve men . . . all of whom are intimately acquainted with GEO Track Construction . . . have expressed the following opinions:

• • •

No. 1—"The line and surface of this track is practically perfect."

• • •

No. 2—"It is my belief that we will find that the maintenance on the GEO is less than half that on standard track."

• • •

No. 3—"GEO is the best piece of track we have."

• • •

No. 4—"This piece of track is the smoothest riding track we have on this division."

• • •

No. 5—"We feel justified in stating that GEO Construction should materially increase the life of rail, particularly on curve track."

• • •

No. 6—"Our maintenance costs for labor have been materially less on GEO track than on standard track."

• • •

No. 7—"It virtually eliminates the possibility of rails spreading and permits replacing of worn rails without damage to ties. It reduces noise to a minimum."

• • •

No. 8—"It is noiseless and those riding trains can tell immediately when they get on and leave this track."

• • •

No. 9—"The track is not churning, rides smoothly, and is much more noiseless than the adjoining track."

• • •

No. 10—"While GEO is costlier in the beginning, we believe that in the end it will result in a great deal of economy because the maintenance work on this type of track has been very much less than on standard track adjacent thereto."

• • •

No. 11—"The lateral movement of the rail is quite materially reduced with the GEO type construction."

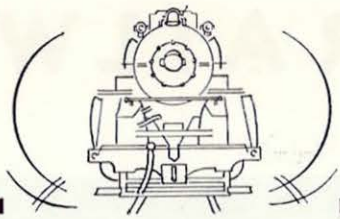
• • •

No. 12—"The thought has come to mind that if the many things in track which down through years of experience we have been trying to overcome, such as mechanical wear of ties, creeping of rail, holding expansion, maintaining good gauge, preventing the battering of rail ends, maintaining good line, etc., could come under one sustained direction for analysis, and a design of appliance be developed to meet all the requirements as nearly as possible, the probability is that a design such as the GEO would be the result."

CARNEGIE STEEL COMPANY • PITTSBURGH • PA.

United States Steel Corporation Subsidiaries

THE LORAIN STEEL COMPANY • JOHNSTOWN • PA.

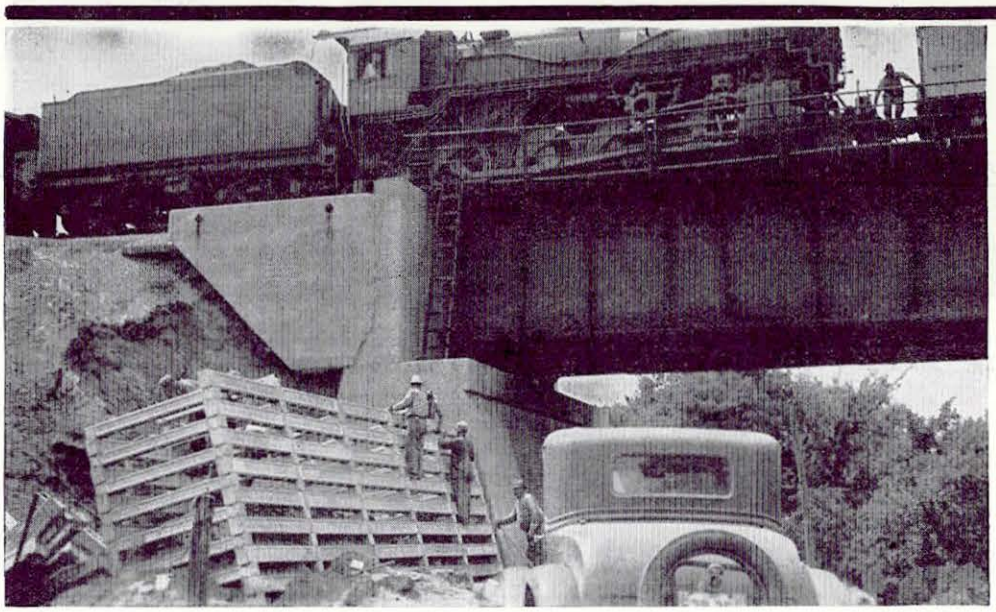


OK'd BY RESPONSIBLE BUYERS

Another Prominent Railroad

erects Armco Metal Cribwall

TO REPLACE FAILING WING WALLS



☆

Armco Metal Cribbing replacing failing wing walls on an important railroad line. The sturdy metal cribbing units were bolted together to form a strong, durable wall.

SETTLEMENT of the foundation under the wing walls of a U-type abutment was causing them to fail. The safety of the roadbed required that repairs be made. After a study of various methods and materials, Armco Metal Cribbing was chosen.

These Armco Metal Cribwalls were found advantageous in the speed and ease with which they were erected. Furthermore, should traffic conditions require a change at this point, these walls can be extended or raised, or even salvaged 100 per cent and used elsewhere.

Ask the Armco engineer for complete data on some of the Armco Metal Cribwalls put in by other responsible buyers.

ARMCO

METAL CRIBBING

For retaining walls

ARMCO

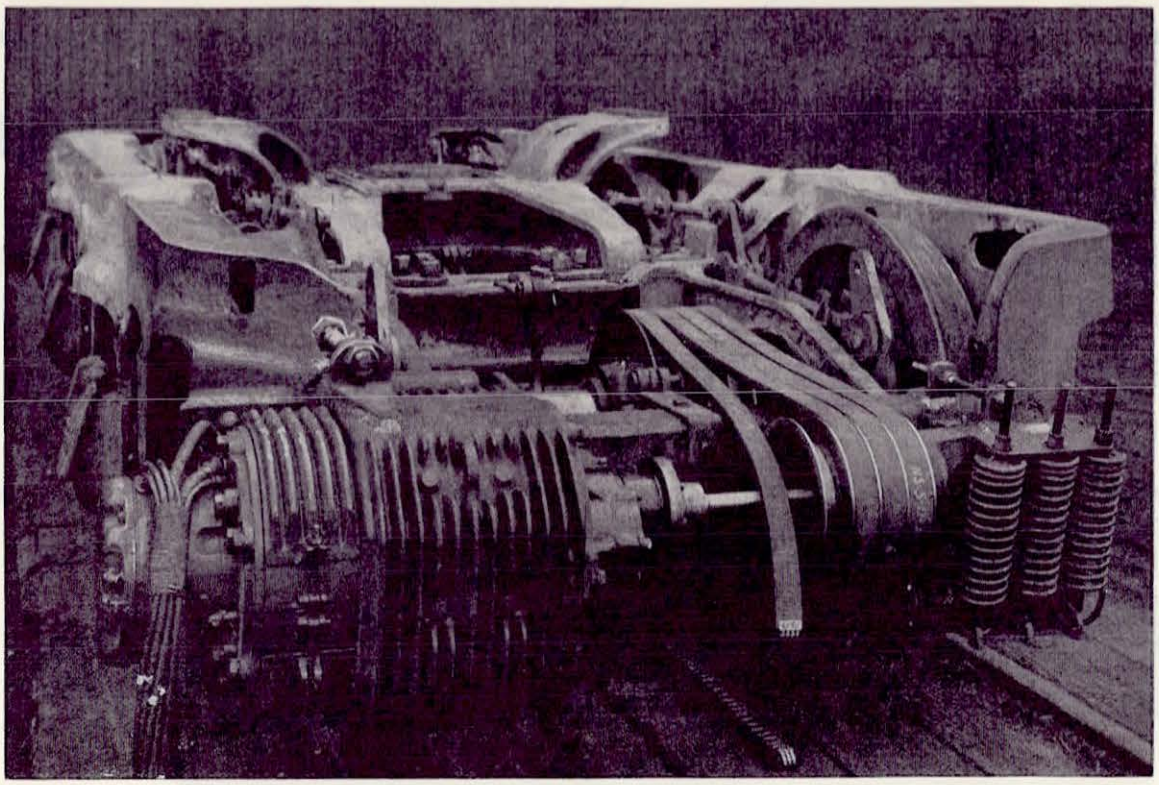
INGOT IRON RAILWAY PRODUCTS CO.

Middletown, Ohio Berkeley, Calif.

Philadelphia St. Louis Salt Lake City Los Angeles
Minneapolis Houston Portland Atlanta Denver
Chicago Dallas El Paso Spokane

(Member of the Armco Culvert Mfrs. Assn.)

MORE POWER • • • FOR RAILWAY CARS



Westinghouse Truck Mounted, Belt Driven Generator. Seventy-three Westinghouse Railway Car Generators were placed in service in 1934. Some were belt driven, some gear driven. All have exellent records.

with 15 and 20 KW. WESTINGHOUSE GENERATORS —

Increased electrical loads—lighting, air conditioning and battery charging—introduced a need for larger capacity railway-car power supply. That need could be fulfilled only by generators of new design, improved drive and control.

Three years ago Westinghouse offered to railroads the first successful large-capacity generator for this purpose. Since then these machines have rolled up millions of miles of highly successful service.

In 1935 these units are available in 15 and 20-kw. capacities in the following types:

1. Center Sill Mounted, Belt Driven
2. Truck Mounted, Belt Driven
3. Axle Hung, Gear Driven

Records show that once installed, these generators stay put. Reliability is their outstanding feature. Maintenance is easy and infrequent.

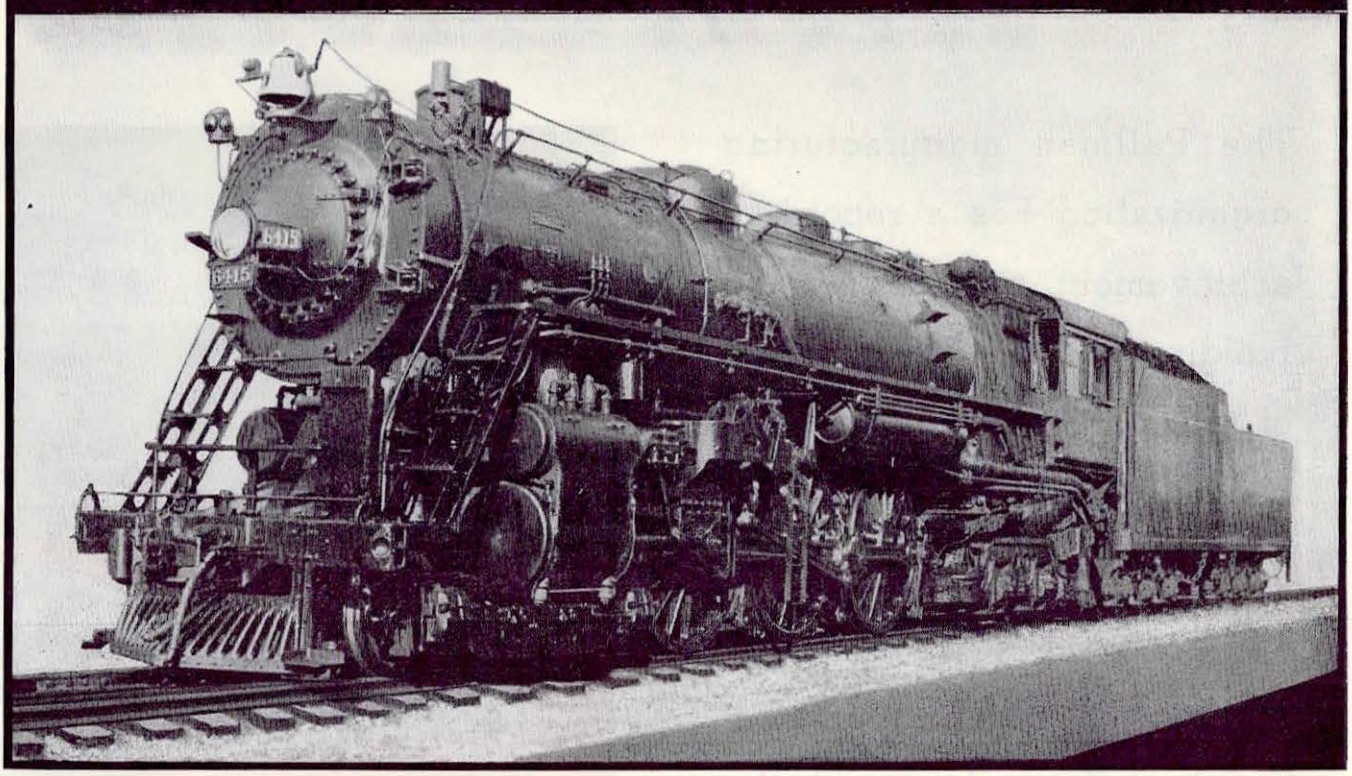
For full information call the nearest Westinghouse representative, or address Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

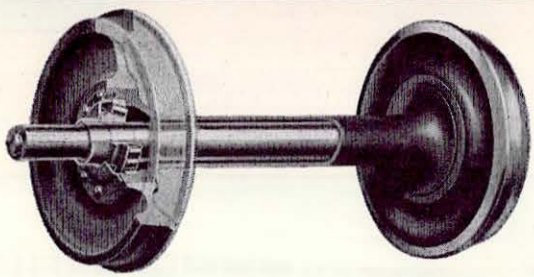
● Available also are combination a-c.--d-c. motors for air conditioning compressor drive.

Westinghouse

R 53002

DEPENDABLE





IN prairie country where severe dust storms are frequent, where winter weather lasts for months... in stormy weather and fair . . . locomotive No. 6415 of the Chicago, Milwaukee, St. Paul & Pacific Railroad, equipped with American Steel Foundries *Roller Bearing Units*, covers 18000 miles every 30 days on its regular run between Minneapolis and Harlowton, Montana.

Of prime importance in maintaining this remarkable performance . . . where little time is available for mechanical attention . . . is the DEPENDABILITY of the American Steel Foundries *Roller Bearing Units*.

The use of American Steel Foundries *Roller Bearing Units* eliminates frequent inspections and hot boxes; promotes lubrication economy and increases availability with a minimum of maintenance attention.

AMERICAN STEEL FOUNDRIES

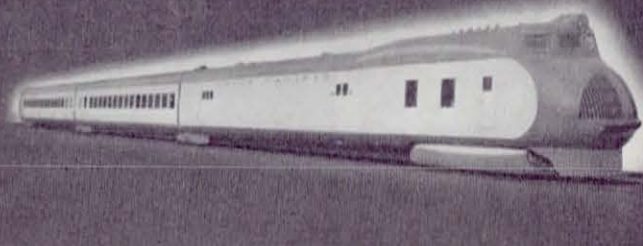
NEW YORK CHICAGO ST. LOUIS

Transportation

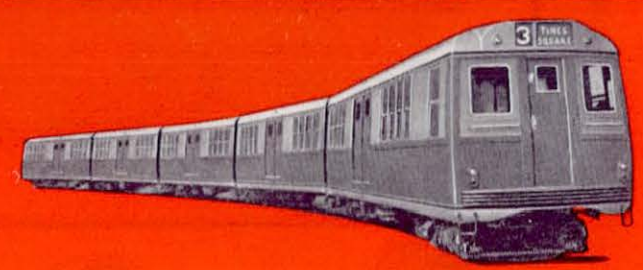
The Pullman manufacturing organization has a record of achievement, not only in the building but also in the design of transportation equipment to keep pace with the fast changing demands of today.

●

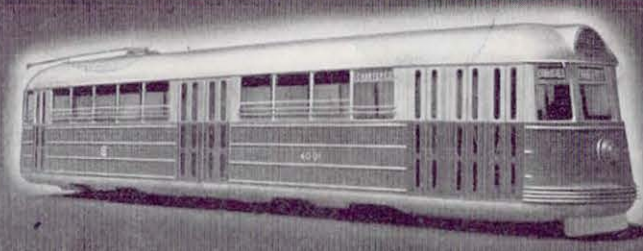
Pullman engineering and research staffs, working with the steam and electric transportation companies, have taken advantage of modern methods and materials in producing equipment of advanced design. The advantage to be gained by making use of the results of Pullman research should not be overlooked.



The first successful American light-weight streamlined train. BUILT BY PULLMAN



Multi-section car, recently delivered, which incorporates many new conceptions in rapid transit. BUILT BY PULLMAN



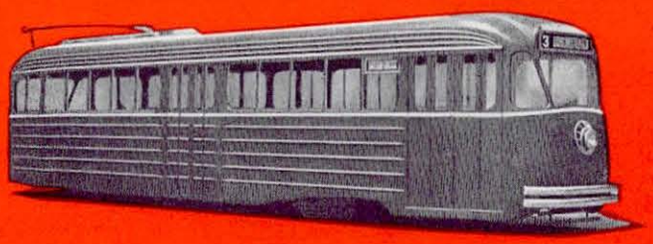
Chicago Surface Lines car completed in 1934, which embodies many new principles of construction. BUILT BY PULLMAN

PULLMAN-

CAR MANUFACT

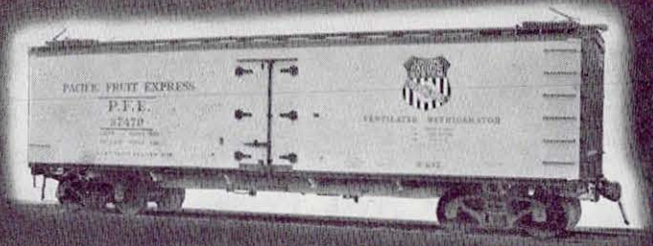
CHICAGO • PITTSBURGH • WASHINGTON, D. C. • NEW ORLEANS

ACHIEVEMENTS

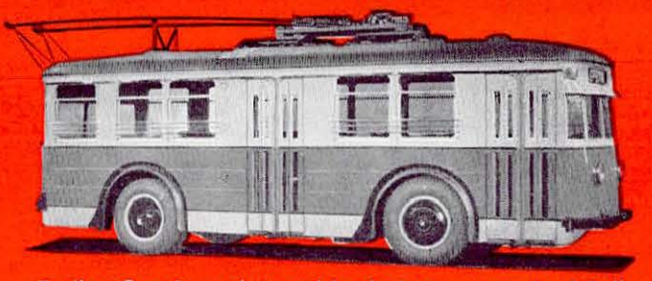


"Presidents Conference Car" delivered in 1934 and designed to meet the requirements of the general electric traction field. **BUILT BY PULLMAN**

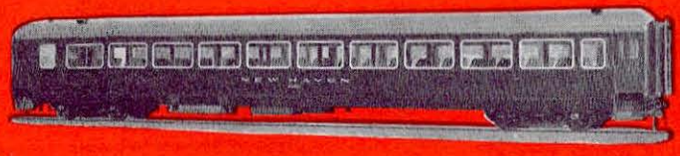
All-steel box car—typical of similar cars constructed for various railroads. **BUILT BY PULLMAN**



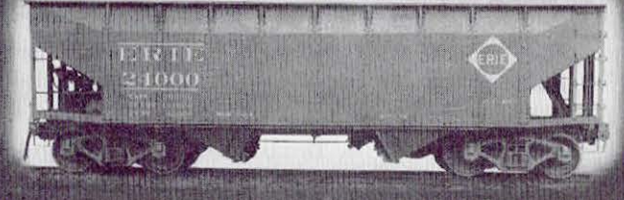
Refrigerator car for the Pacific Fruit Express; a typical example of many such cars that have been **BUILT BY PULLMAN**



Trolley Coach—advanced in design—a result of Pullman engineering and research. **BUILT BY PULLMAN**



Light-weight modern passenger coaches now being completed for the "New Haven." **BUILT BY PULLMAN**



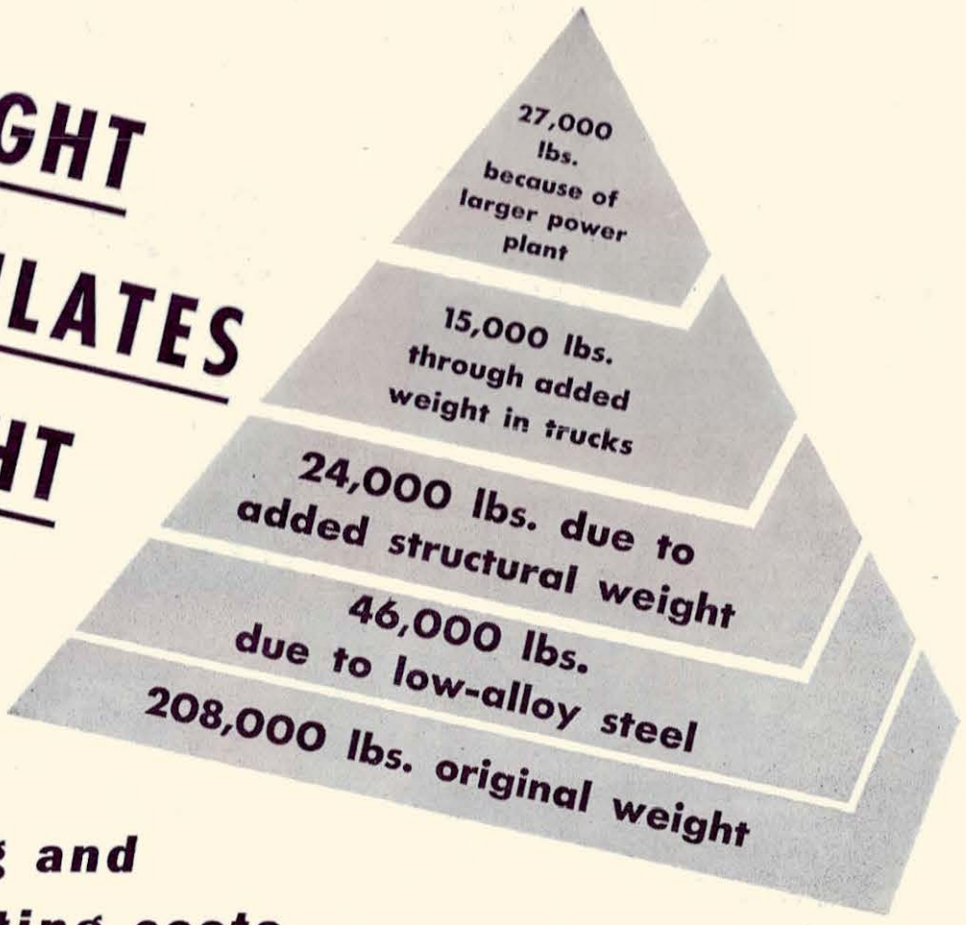
Hopper car—typical of the many types of freight cars that are **BUILT BY PULLMAN**

STANDARD
URING COMPANY

HOUSTON • BALTIMORE • BIRMINGHAM • NEW YORK • WORCESTER, MASS.

In railway construction

WEIGHT ACCUMULATES WEIGHT


27,000 lbs. because of larger power plant
15,000 lbs. through added weight in trucks
24,000 lbs. due to added structural weight
46,000 lbs. due to low-alloy steel
208,000 lbs. original weight

and building and operating costs

PYRAMID

THE maximum in *reduced* weight and increased speed without sacrifice of strength at any point can be attained only through use of stainless steel as fabricated by the Budd "Shotweld" system of construction.

Budd built the Burlington Zephyr with stainless steel because it permitted a weight saving of 40%.

A lower-priced alloy — in order to provide the same weight-strength ratio as stainless steel—would have increased the original weight of 208,000 pounds by 46,000 additional pounds.

See how the weight pyramids! 254,000 pounds would require an *additional* 24,000 pounds in structural weight. That would necessitate 15,000 pounds *more* for truck strength. And lastly, *another* 27,000 pounds for a larger power plant costing an additional $31,000.

Add to this the extra fuel, oil and maintenance expense of $4000 per year to operate the larger power plant and the pyramid reaches a tremendous height. The false economy of using the cheaper but heavier metal is strikingly evident.

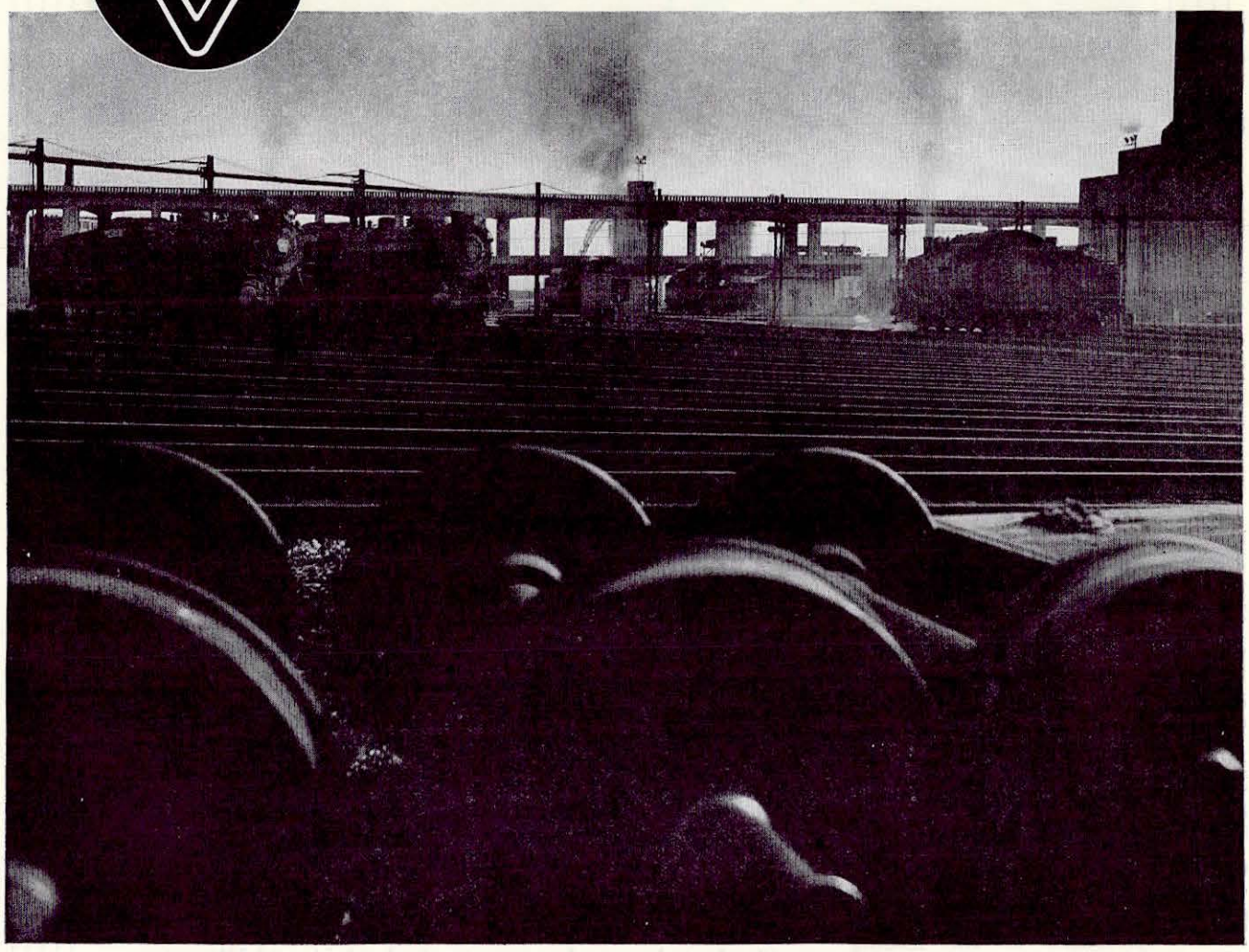
The goal of modern transportation is increased passenger traffic, lower operating costs and greater profits. This goal will not be reached through compromise. The Budd system of stainless steel construction — "Shotweld" — is the only certain way of achievement.

SPEED WITH SAFETY

EDW. G. BUDD MANUFACTURING COMPANY

PHILADELPHIA

"WAGON WHEELS" Wheels, wheels, wheels . . . rumbling over rutty trails and broad, sun-lit prairies . . . speeding today over gleaming ribbons of steel . . . what a dramatic heritage for the railroad man of today. And for Armco, too—a company that has put its all into the manufacture of safe, long-wearing, dependable wheels for railroads large and small. • When you buy wheels, remember the name Armco—on *One-Wear* wheels for light, fast freight traffic; on Armco *Multiple-Wear* Wheels for heavy-duty service; and on Armco *Heat-Treated* Wheels for extra long wear in the hardest service. • An experienced Armco Wheel Man will be glad to tell you more about these serviceable products. Just communicate with the office nearest you.



★ ARMCO RAILWAY SALES CO. ★

Subsidiary of The American Rolling Mill Company

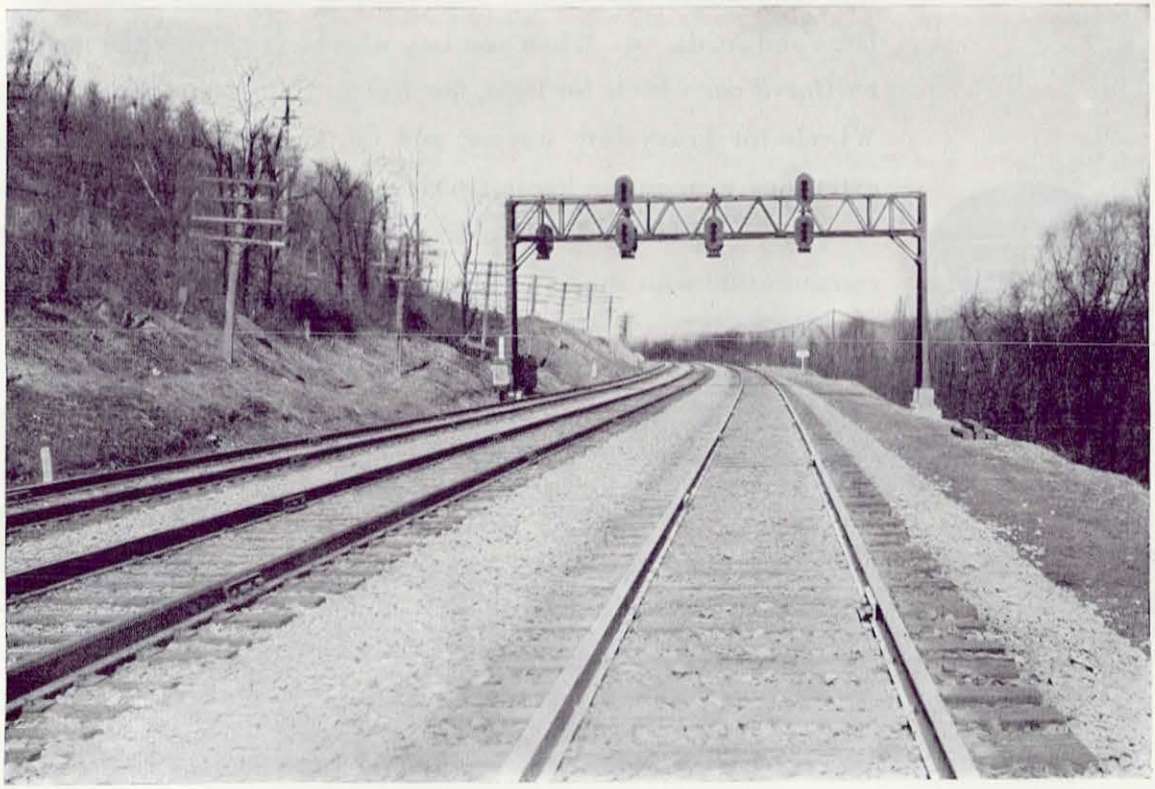
Executive Offices: Middletown, Ohio

Chicago Cleveland New York Philadelphia St. Louis San Francisco

ARMCO IRON AND STEEL

The RIGHT Sheet • Plate • Wheel for any Railroad Requirement

AmCreCo Products fit into any modernizing program



HIGH speed, new passenger luxuries, new freight services—these are the popular phases of today's modernizing trend.

But every railway maintenance engineer and executive knows that if "modernizing" is to mean *improving* railway operation, the program must include many less spectacular items. For instance, maintenance of track and structures must be brought up to date and kept there.

If the "modern" railway is to be the *profitable* railway, full advantage must be taken of past experience in maintaining property to a high standard and at minimum annual cost. AmCreCo creosoted ties, poles, piles and timber have demonstrated their ability to contribute to this result. On their record, they deserve adoption.

Why
AMCRECO PRODUCTS
have maximum quality

1. Carefully selected timber.
2. Incipient decay avoided.
3. Framing before treatment.
4. Preservative of known value.
5. Adequate treatment.
6. Treatment accurately timed to proper seasoning.
7. Unequalled facilities and personnel of the leading producer.

NRA
WE DO OUR PART

AMERICAN CREOSOTING COMPANY
INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED

AMCRECO LOWRY PROCESS CREOSOTED WOOD

GEORGIA CREOSOTING COMPANY INCORPORATED

LOUISVILLE — KENTUCKY

Reduce Costs and Build Traffic with Diesel-Electric Motive Power

General Electric drive powers Lackawanna's 20 Diesels

24 Hours on ½ ton of fuel

DIESEL-ELECTRIC switching locomotives average 5.75 gallons (42 lb.) of fuel an hour — this, figured at 4¢ a gallon, is only $5.52 for 24 hours of actual service. Maintenance is about 60 cents an hour; the availability, 85 per cent. Many of these locomotives actually operate 80 per cent of the calendar hours of a year.

Such operating results as these have led the Lackawanna to buy four more Diesel-electrics. These, now being completed in our Erie Works, make a total of 20 for this railroad* — all of which have General Electric drive.

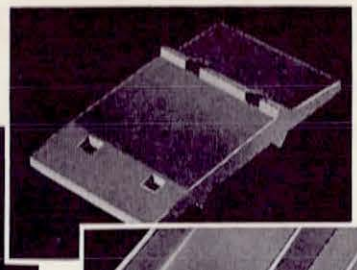
Diesel-electric motive power with G-E equipment will reduce operating expense in all types of service — main-line passenger and freight locomotives, streamlined trains, conventional rail motor cars, switchers. Motive-power units of each of these types, using General Electric drive, are now in service or under construction.

**Of Lackawanna's 20 Diesels, 6 are 600-hp. units as pictured above, 10 others are also 600-hp., 2 are 300-hp., and 2 are 300-hp. 3-power units using a Diesel, battery, or 3000-volt trolley power source.*

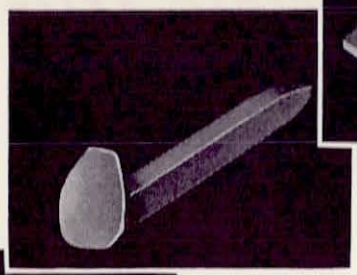
250-6

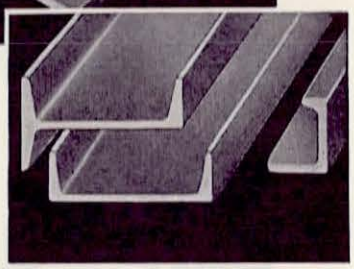
GENERAL ELECTRIC

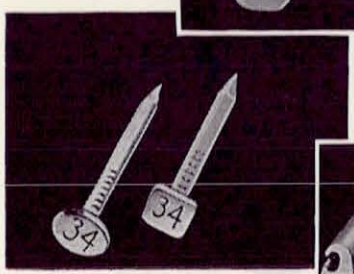
Tie Plates
Hot and Cold Worked



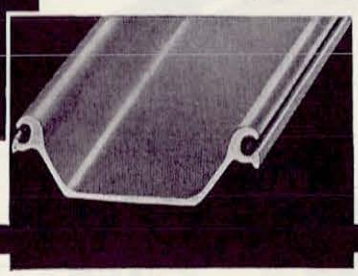
Track Spikes







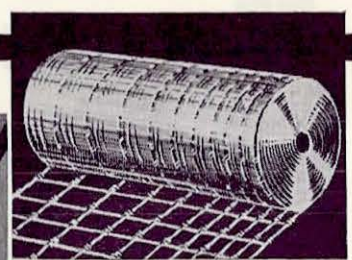
Galvanized
Tie Dating Nails



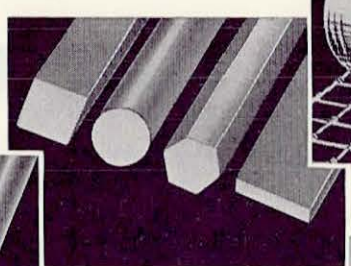
Center Sill Beams,
Bulb Angles, Other
Car Shapes and
Plates

Steel Piling

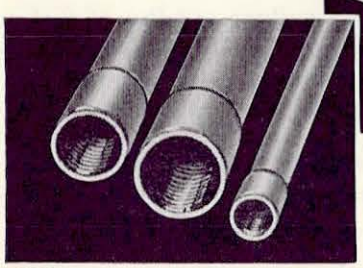
JONES & LAUGHLIN RAILWAY MATERIALS



Cold Finished
Steel

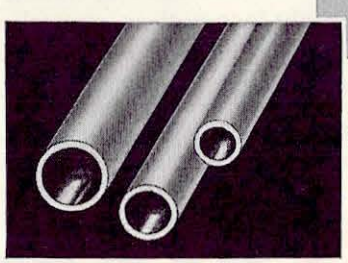


Right-of-Way
Fence



TOTAL ANNUAL
STEEL INGOT
CAPACITY
3,660,000 TONS

Steel Pipe
Welded and Seamless
Black and Galvanized



Hot Rolled
Seamless Steel
Boiler Tubes

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON AND STEEL WORKS.
JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

EQUIP YOUR CARS

with

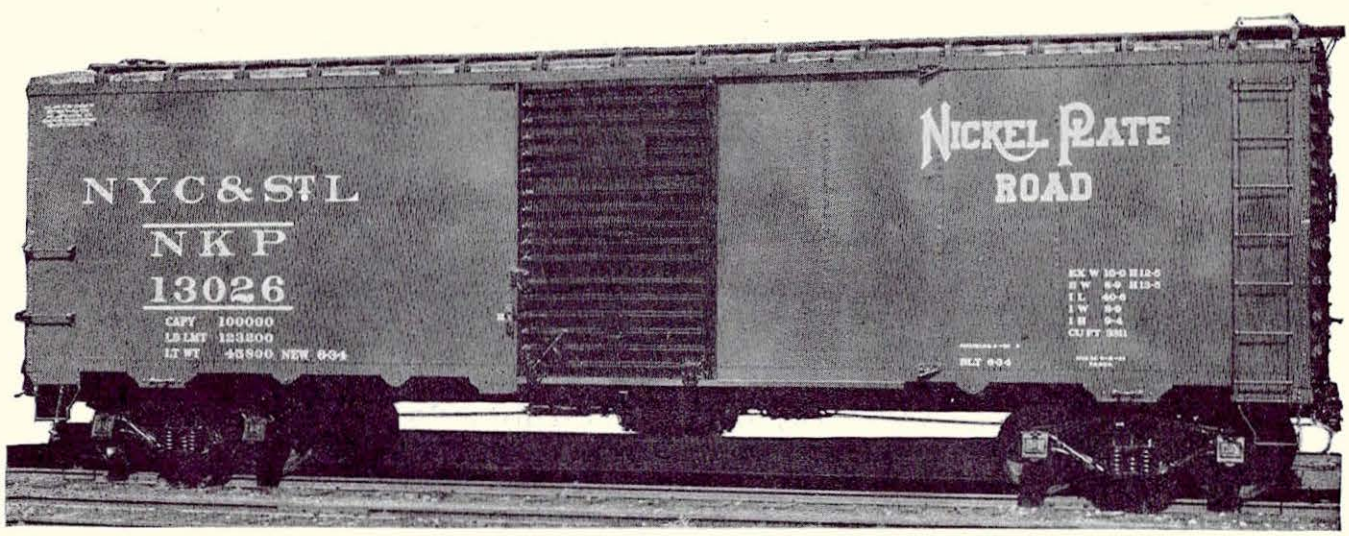
YOUNGSTOWN

STEEL DOORS

and

CAMEL

ROLLER LIFT FIXTURES

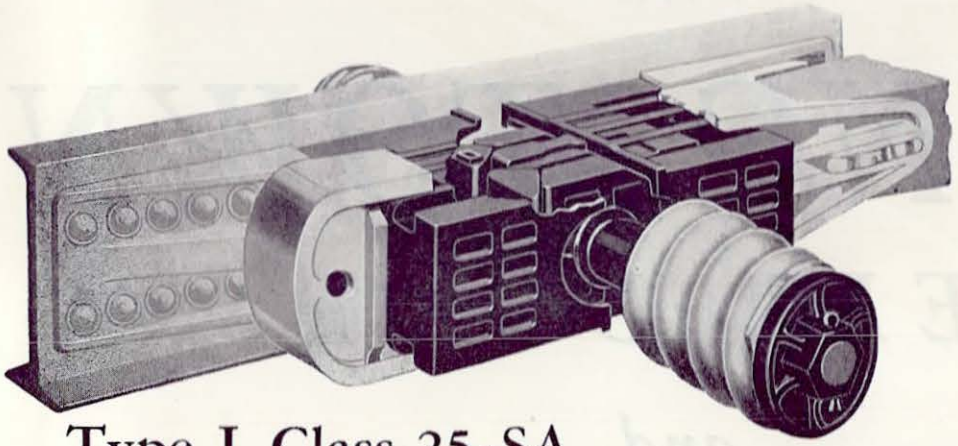


CAMEL SALES COMPANY

332 SO. MICHIGAN AVENUE

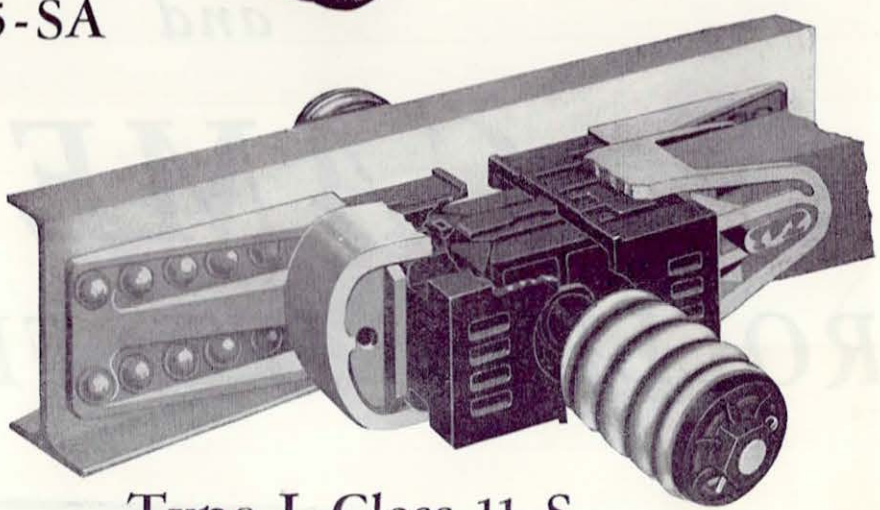
CHICAGO *ILLINOIS*

Identical in Capacity
CARDWELL FRICTION DRAFT GEARS



Type L Class 25-SA

Certified A. R. A. 1931



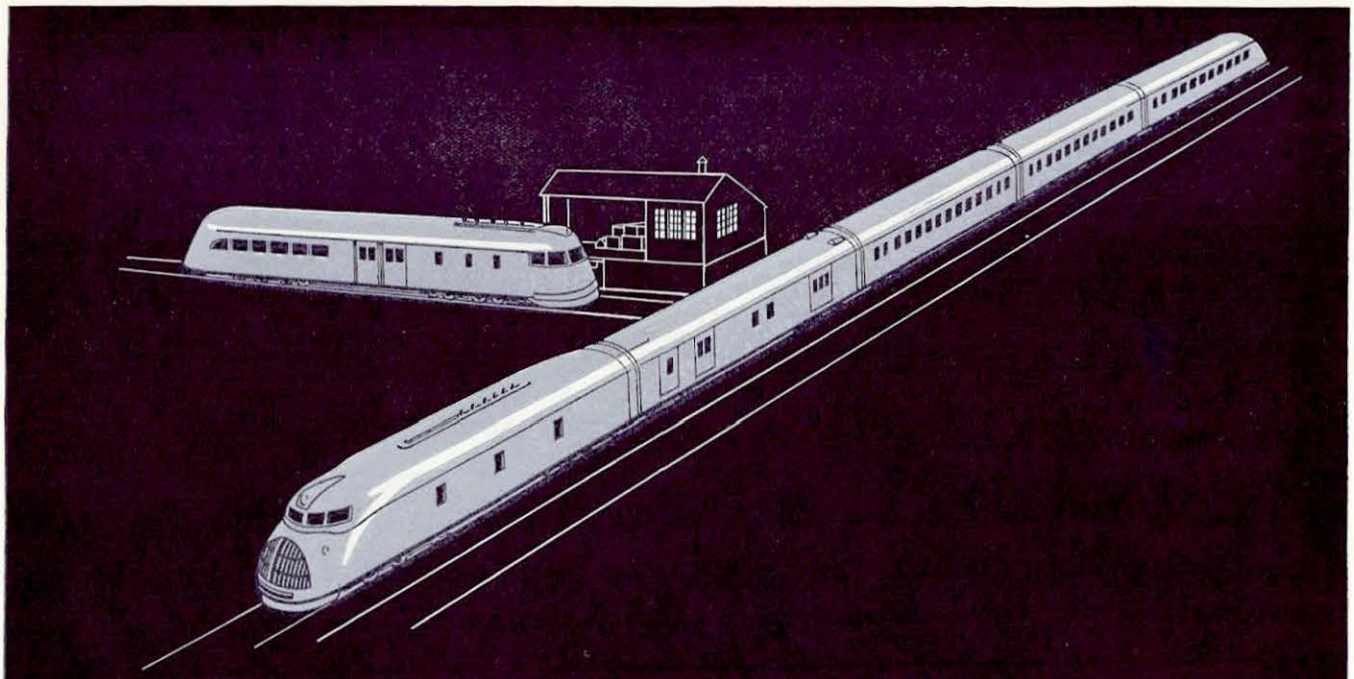
Type L Class 11-S

All parts identical and interchangeable except friction casings.

The Cardwell L-11-S Gear, requiring a yoke pocket only 18½" long, develops the same capacity and car protection as the Cardwell L-25-SA Certified Gear, the latter requiring a 24⅝" yoke pocket.

Cardwell Westinghouse Company
332 South Michigan Avenue, Chicago, Ill.

CANADIAN CARDWELL COMPANY, LTD.
Royal Bank Building, Montreal, Quebec



WEIGHT IS THE COMMON DENOMINATOR

of most Passenger traffic Problems

ALCOA

● Alcoa Aluminum is no panacea for passenger traffic problems. But more and more its characteristics are being recognized as the logical answer to some of the most generally accepted necessities of the industries.

We have in mind the consensus of opinion that schedules must be faster, particularly for trains not in the "name" class; that service must be more frequent; and that equipment must be more comfortable, particularly to attract more short-haul coach traffic.

Ultimately the many conditions will be met with many new forms of equipment. And it is a sound prediction that Alcoa Aluminum will have a major part in those new designs.

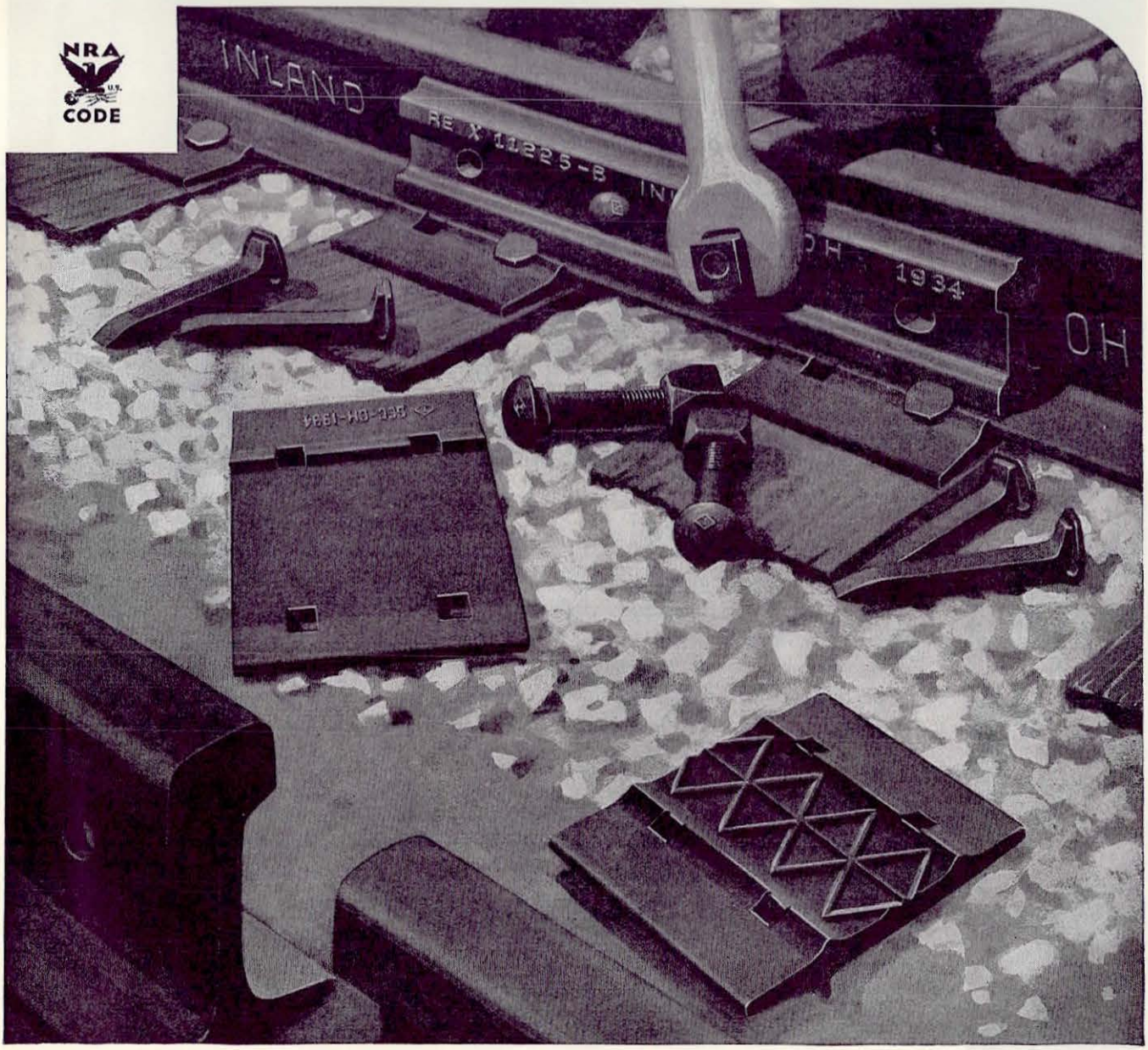
For no other metal offers the inescapably sound combination of lightness, great strength, resistance to corrosion, and unique structural possibilities found in the many versatile alloys of Alcoa Aluminum.

Structurally, Alcoa Aluminum is right; economically Alcoa Aluminum is proving its own case on all types of rolling stock, both passenger and freight. All the facts, and all our experience are at your disposal. ALUMINUM COMPANY OF AMERICA, 1878 Gulf Bldg., Pittsburgh, Pa.

ALCOA ALUMINUM

AS NEW DEMANDS for SPEED, SAFETY and SERVICE BRING NEW PROBLEMS . . . CONSULT INLAND . . . on RAILS . . . ANGLE SPLICE BARS . . . TIE PLATES . . . SPIKES . . . BOLTS and other Rolled Steel Products

NRA U.S. CODE



INLAND STEEL

ABLE SERVANT OF THE CENTRAL WEST

Sheets Strip Tin Plate
Plates Structurals Piling

Rails Track Accessories
Bars Rivets Billets

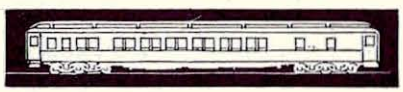
38 S. Dearborn Street, Chicago, Ill.

There is a decided Railway preference for Exide Batteries

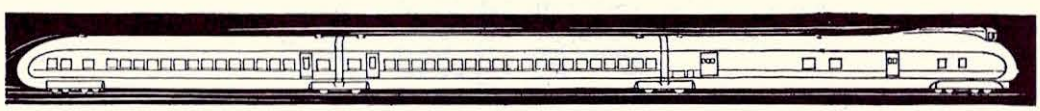
Here, in brief, are the facts that demonstrate the definite preference for Exide Batteries

Since 1925, the majority of all new signals installed have included the Exide A.C. Floating Battery System. (Based on "Railway Age" yearly statistical figures.) In addition, a large mileage of signals has been changed over yearly from other sources of power supply to the Exide A. C. Floating Battery System.

The majority of cars air-conditioned during 1934 used new Exide-Ironclad Batteries. (Based on "Railway Electrical Engineer's" Statistical Article, December 1934.)



The majority of Streamlined Trains, Diesel Locomotives, Diesel-Electric and Gas-Electric Rail Cars have their engines started by Exide-Ironclad Batteries.



The Electric Storage Battery Company appreciates this endorsement by the railways of America, and realizes the obligation it imposes. We regard it as a further incentive and obligation to maintain the value of Exide Batteries to the industry — to continue producing a product that merits your confidence.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

The World's Largest Manufacturers of Storage Batteries for Every Purpose

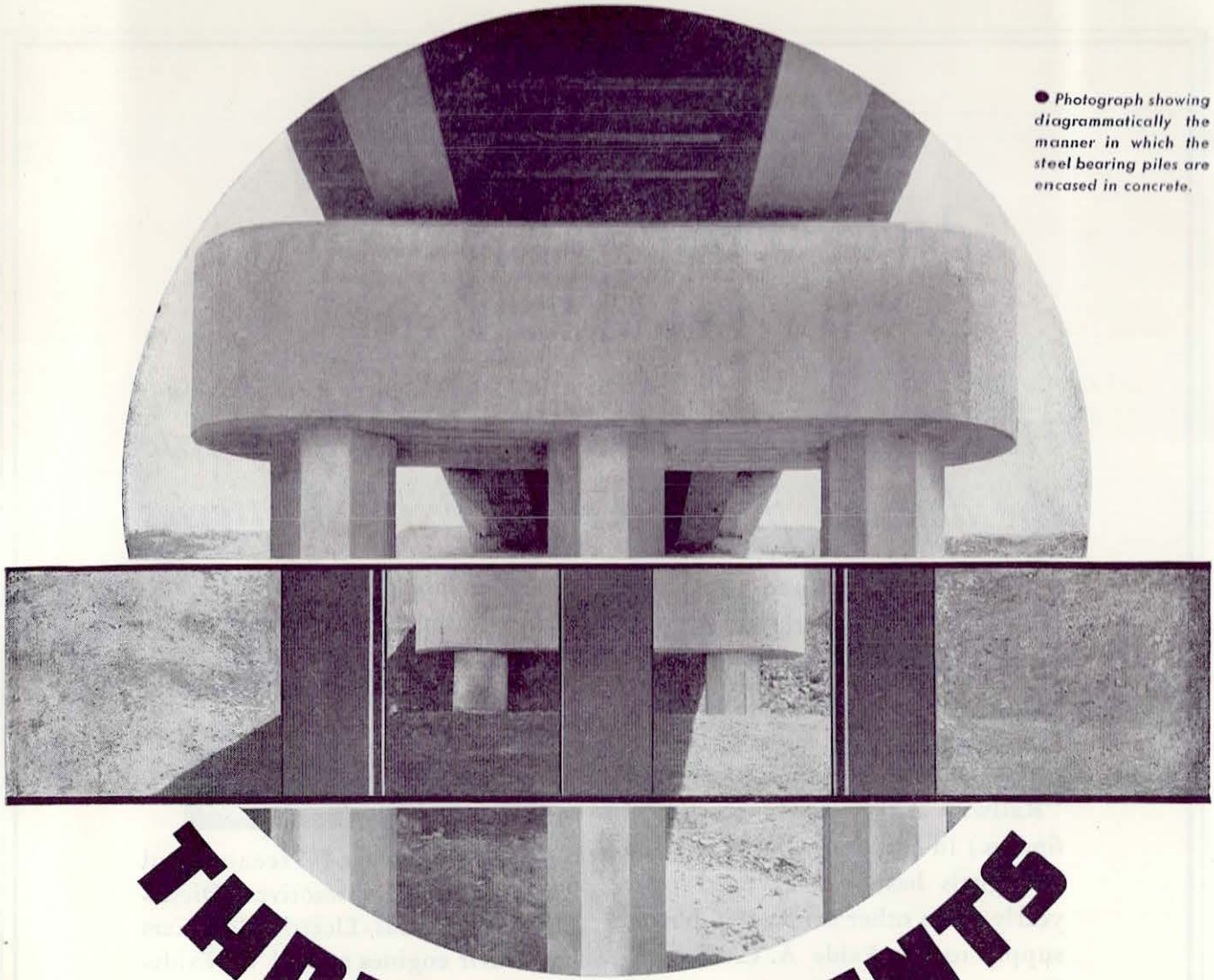
Exide Batteries of Canada, Limited, Toronto

Exide

BATTERIES

FOR EVERY RAILWAY PURPOSE

NRA CODE



● *Photograph showing diagrammatically the manner in which the steel bearing piles are encased in concrete.*

THREE-PILE BENTS

with these steel bearing piles *speed up bridge construction*

● Three-pile bents, using steel bearing piles, reduced the cost and expedited the building of this Missouri Pacific Railroad Company bridge at Wichita, Kansas. With this type of construction, it was unnecessary to remove portions of the old structure in driving the new piles. This permitted utilization of working time to the fullest extent.

For hard driving or in locations where substantial bottoms are difficult to reach, CB SECTIONS as bearing piles provide a sound and economical foundation. The ease with which they can be driven means usually a definite saving in construction time and cost. In the bridge here illustrated the piles were driven through 35 to 40 feet of sand to reach firm shale. Jetting was unnecessary and no difficulties in driving were encountered. Additional information on the use of steel bearing piles in both railway and highway bridges may be had upon request.

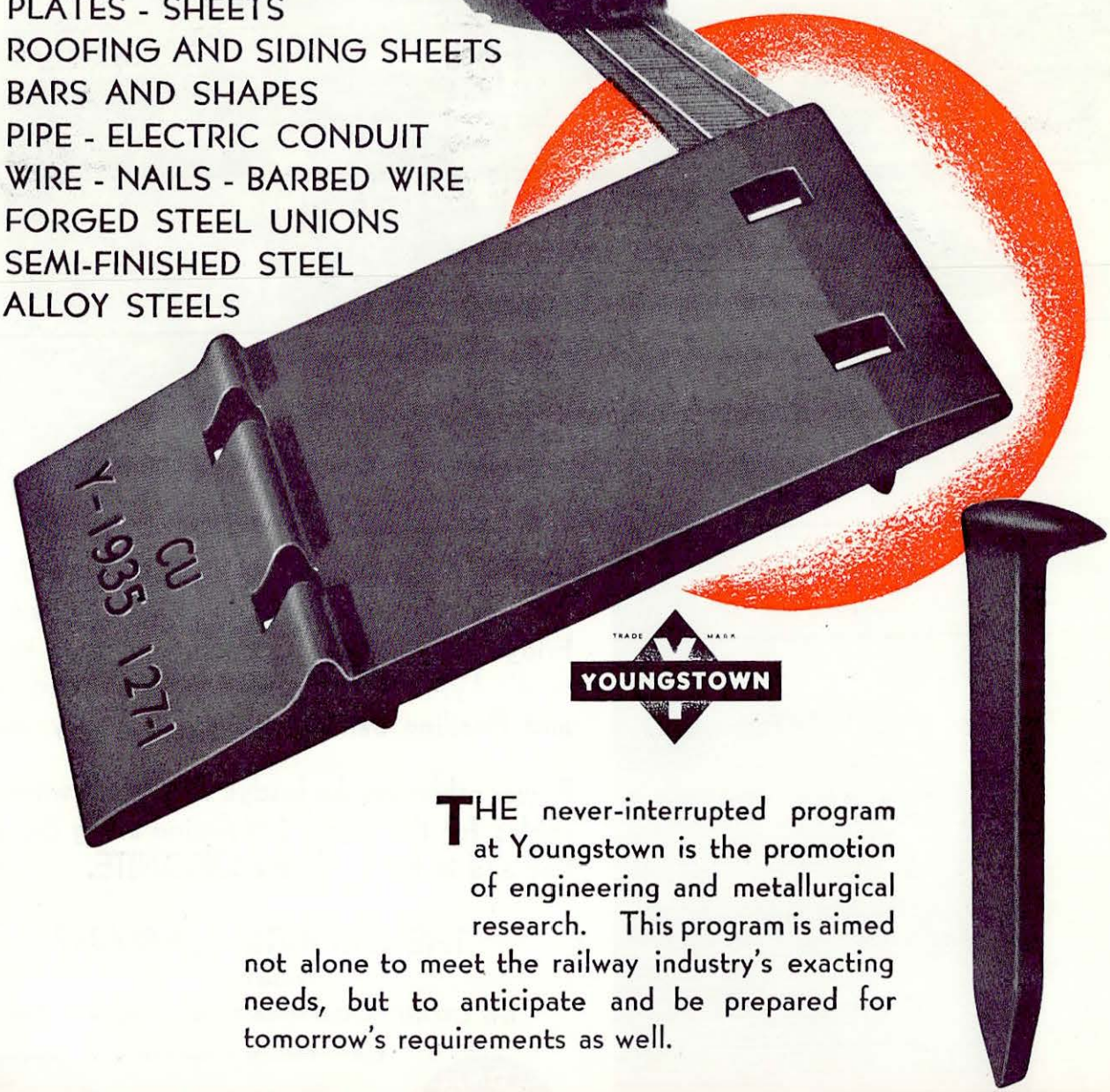
Illinois Steel Company
SUBSIDIARY OF UNITED STATES STEEL CORPORATION
208 SOUTH LA SALLE STREET • • CHICAGO, ILLINOIS

STEEL BEARING PILES
I I CB SECTIONS

YOUNGSTOWN

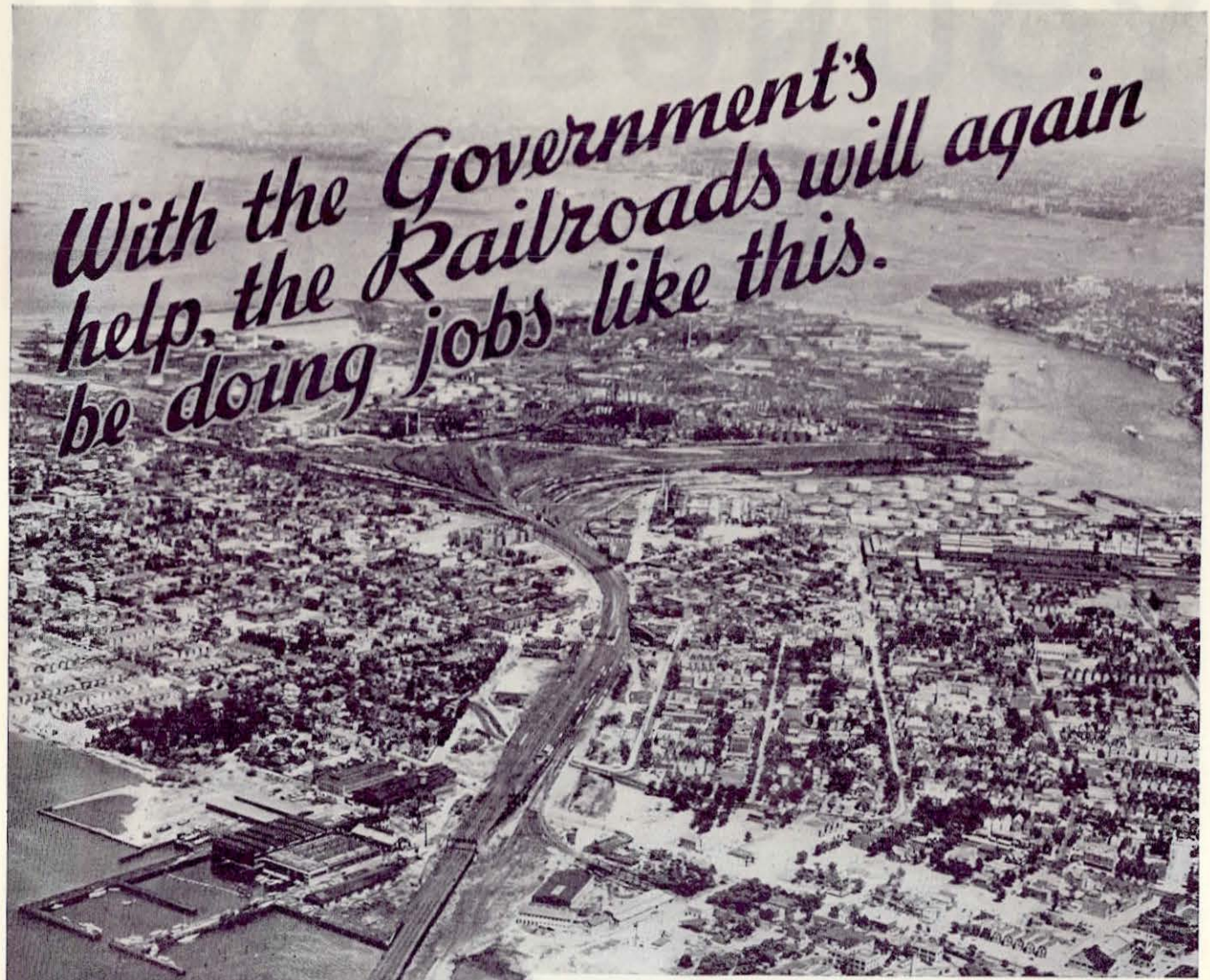
RAILWAY MATERIALS

TIE PLATES - SPIKES
PLATES - SHEETS
ROOFING AND SIDING SHEETS
BARS AND SHAPES
PIPE - ELECTRIC CONDUIT
WIRE - NAILS - BARBED WIRE
FORGED STEEL UNIONS
SEMI-FINISHED STEEL
ALLOY STEELS



THE never-interrupted program at Youngstown is the promotion of engineering and metallurgical research. This program is aimed not alone to meet the railway industry's exacting needs, but to anticipate and be prepared for tomorrow's requirements as well.

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices - - YOUNGSTOWN, OHIO



TRAINS of the Central R. R. of New Jersey cross Newark Bay on the big, four-track lift bridge west of Bayonne and turn north to the terminal yards at Jersey City. Baltimore and Ohio and Reading trains use the same busy tracks.

Power cables for the bridge and all the wires and cables for the signal installation along the main line and in the yards are OKONITE.

THE OKONITE COMPANY

Founded 1878

THE OKONITE-CALLENDER CABLE COMPANY, INC.

Factories: Passaic, N. J., Paterson, N. J.

SALES OFFICES:

NEW YORK CHICAGO DETROIT PHILADELPHIA PITTSBURGH ST. LOUIS
ATLANTA SAN FRANCISCO LOS ANGELES SEATTLE DALLAS

General Electric Supply Corp., Boston, Mass
Canadian Representatives: Engineering Materials, Limited, Montreal

MAGNUS METALS

For Service and Delivery

BRONZE ENGINE CASTINGS
SATCO LINING MATERIAL
CAR AND LOCOMOTIVE
JOURNAL BEARINGS

Where Records are Made
You Will Find Magnus Products

"MAGNUS PRODUCTS ARE BRASS INSURANCE"

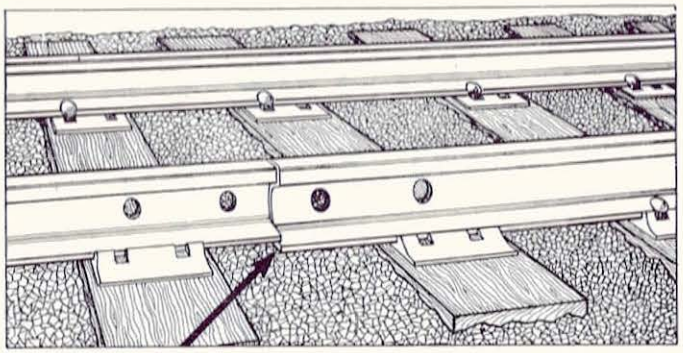
MAGNUS JOURNAL BEARINGS
STAND UP UNDER
THE HEAVIEST LOADS

LINK THE RAILROADS AND THE DURABLE GOODS INDUSTRY

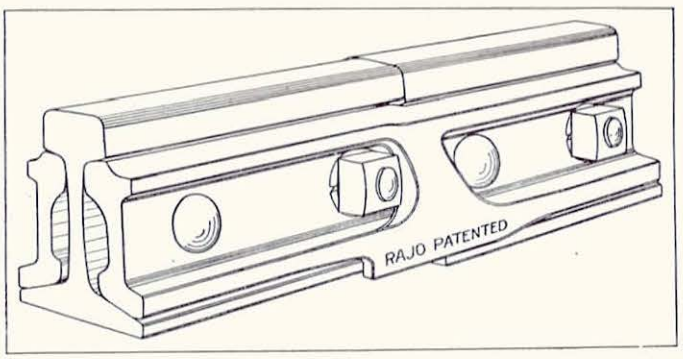
MAGNUS COMPANY INC.
CHICAGO NEW YORK

SAFETY

Demands The Strongest Joint



At The Weakest Point



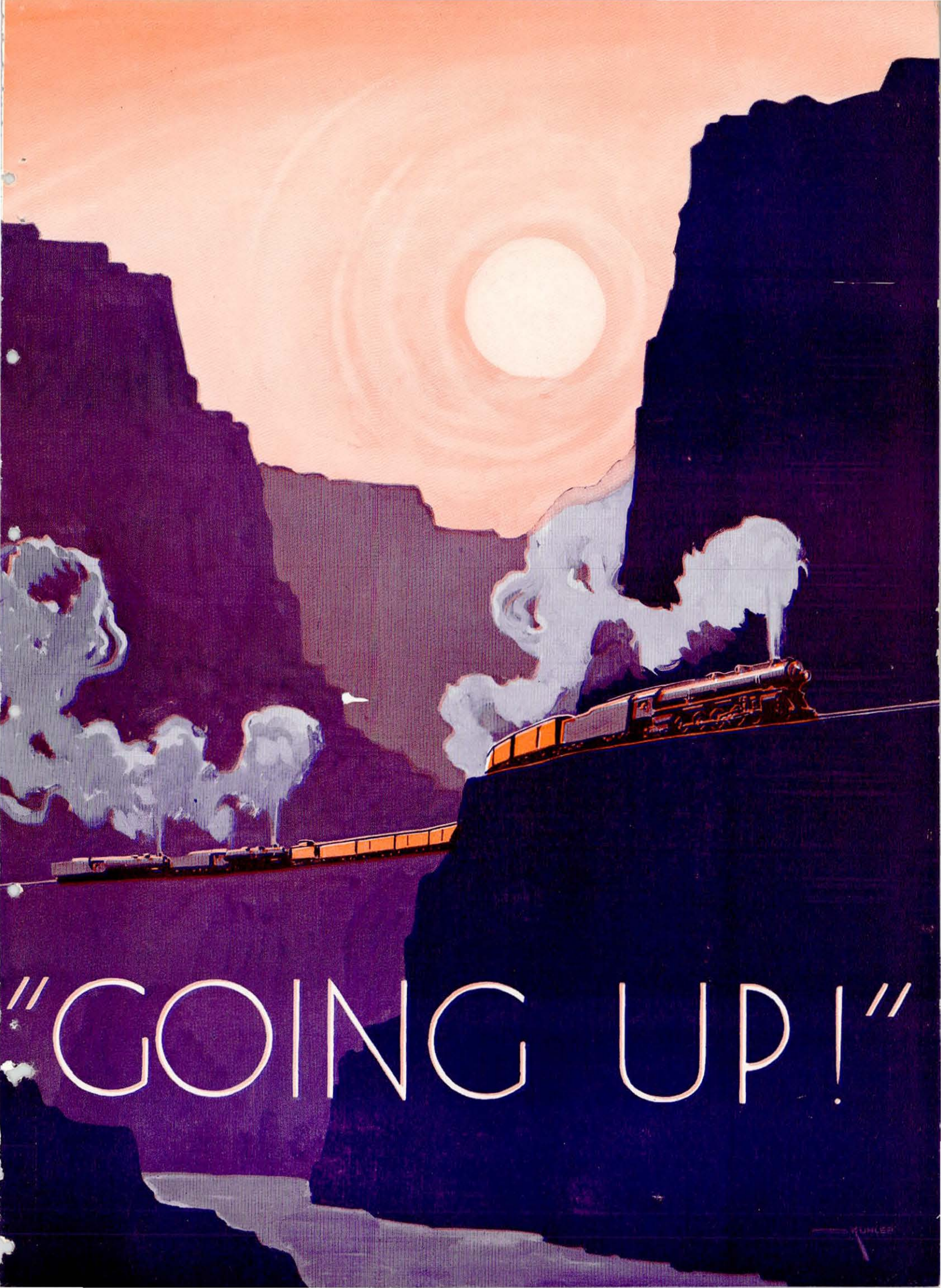
Rajo Cast Alloy Compromise Joint

REPLACEMENTS due to failure of RAJO CAST ALLOY COMPROMISE JOINTS since their introduction in 1926, are less than 1/10 of 1 per cent.

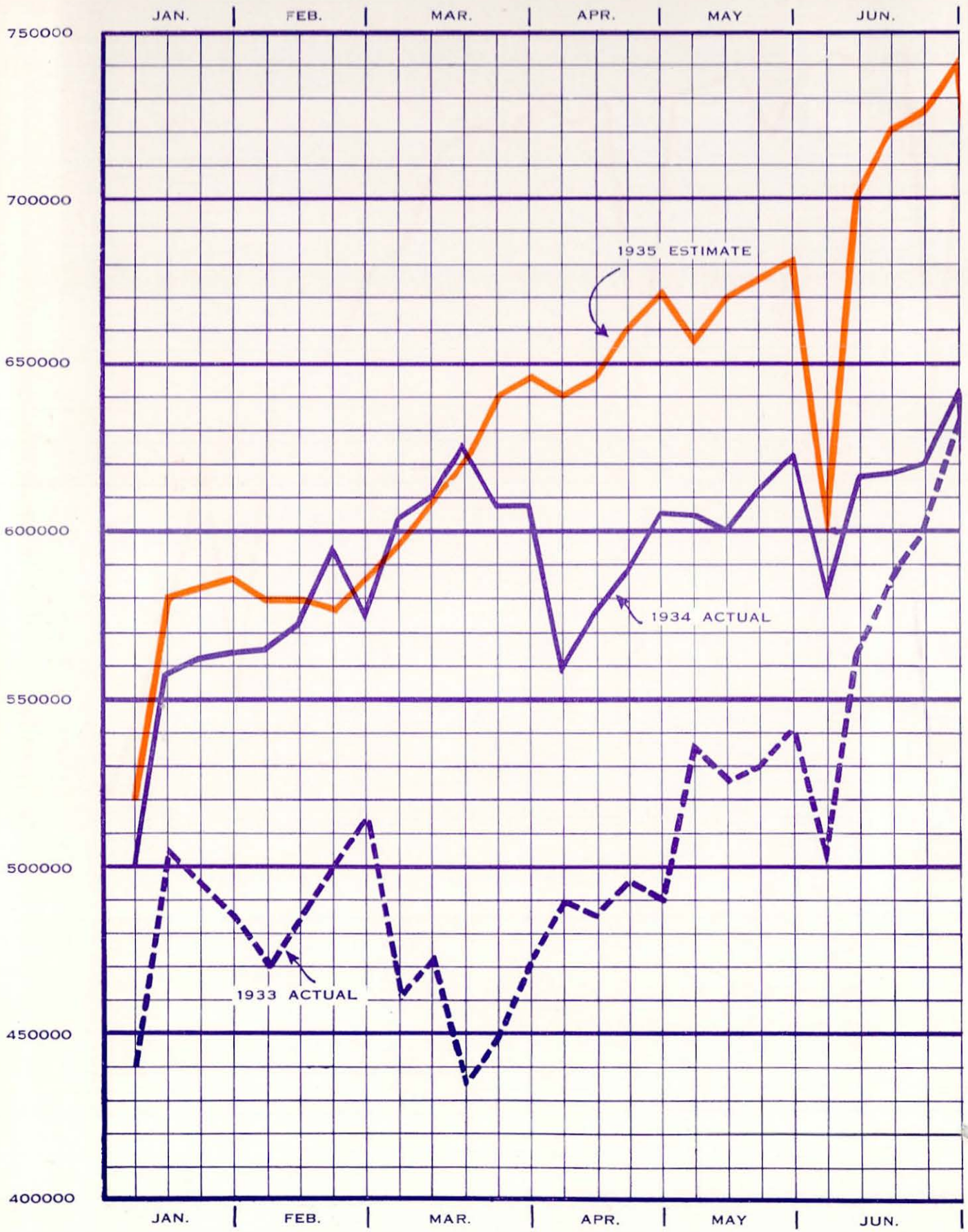
We furnish also the Angle Bar type, Continuous type, and Controlled Bearing type, in either Headfree or Head Contact designs in RAJO CAST ALLOY STEEL.

THE RAIL JOINT COMPANY

165 BROADWAY, NEW YORK, N. Y.

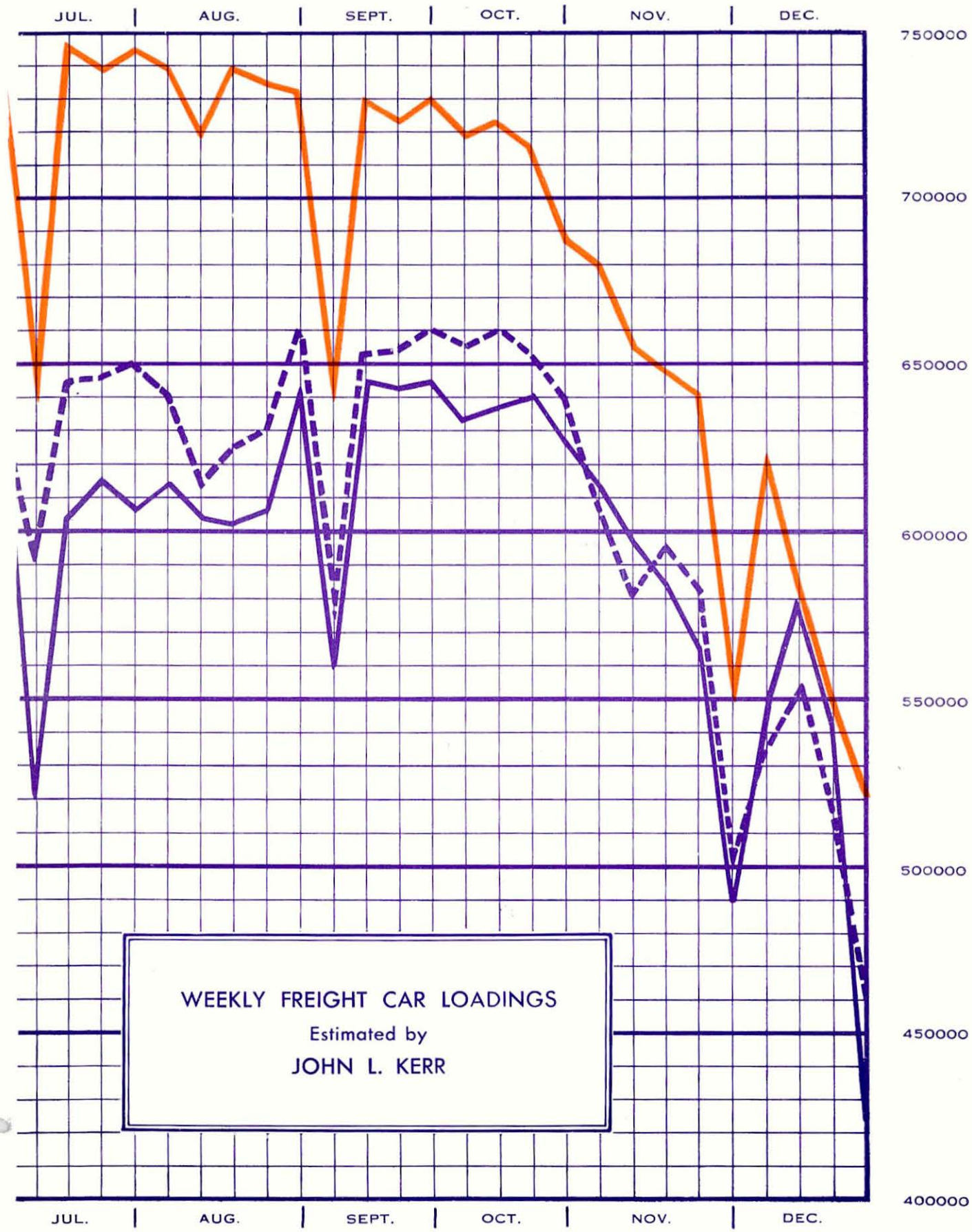

"GOING UP!"

AMERICAN LOCOM



30 CHURCH STREET

OTIVE COMPANY



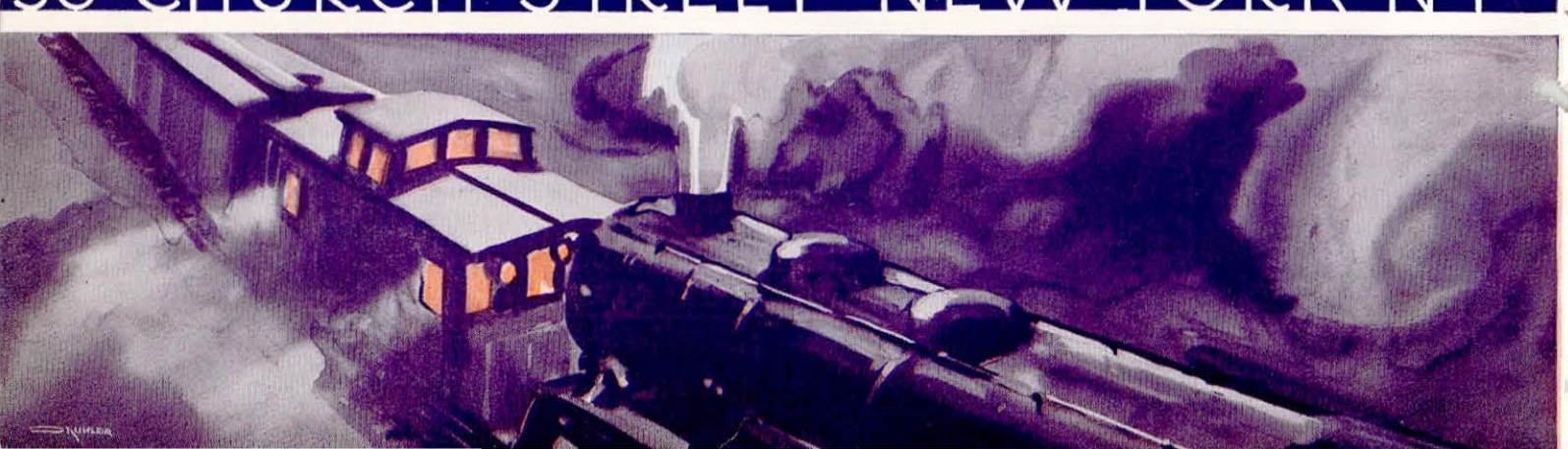
NEW YORK N.Y.

AMERICAN LOCOMOTIVE COMPANY

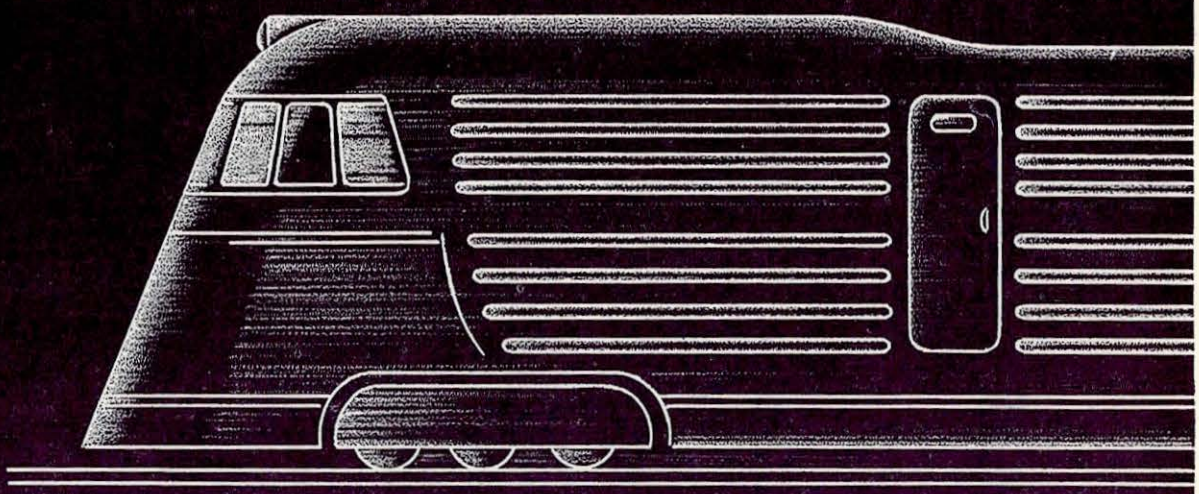
Who Is John L. Kerr?

Mr. John L. Kerr, a railroad economist, for years has been making surprisingly accurate estimates of carloadings. • In 1932 he correctly predicted a contra seasonal decline during the first half of the year and estimated total carloading to be 27,300,000. Actual carloadings were 28,179,000. • Early in 1933, he published his forecast of a spring rise and no seasonal expansion in the fall. He estimated total carloadings of 31,000,000 against an actual of 28,960,000, the large difference being attributable mostly to the unforeseen bank holiday. • In 1934 he correctly predicted a falling off of traffic during the summer with no fall expansion. He estimated total loadings to be 30,703,000 as against an actual of 30,785,000. • His estimate for 1935, herewith reproduced, predicts an expansion of carloadings starting in March and continuing throughout the summer. He estimates that the total carloadings will be 34,125,000 in the year 1935. • Such accurate forecasting merits much more than just passing attention. His past record is such that due concern should be felt concerning the ability to handle this predicted traffic with present motive power facilities. • • •

30 CHURCH STREET • NEW YORK • N.Y.



METALS *IN MOTION*



MUST BE STRONG . .

• Metals used for fabricating railroad equipment must have extra strength to withstand shocks and strains and to permit reduction of dead load. Two of the most suitable extra strength metals are the alloy steels, "Stainless Steel" and the low chromium steels.

STAINLESS STEEL

Stainless steel with its properties of high strength and corrosion resistance provides a material suitable for both covering and inner structures of cars. Used as a covering it presents a thin but very strong surface that will not rust or corrode and needs no coating or plating to preserve its mirror-like appearance. For inner structure, it is fabricated into hollow box beams which combine extraordinary lightness with strength and permanency.

LOW CHROMIUM STEELS

Low chromium steels were developed to meet requirements of high strength and ease of fabrication together with low cost. They are used in conjunction with stainless steel for constructing equipment parts that necessarily must be made of an inexpensive material. Such parts as wheel trucks and engine beds and bases, constructed of low chromium steel provide considerable saving in weight over ordinary steel because of increased metal strength.

PRODUCT OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

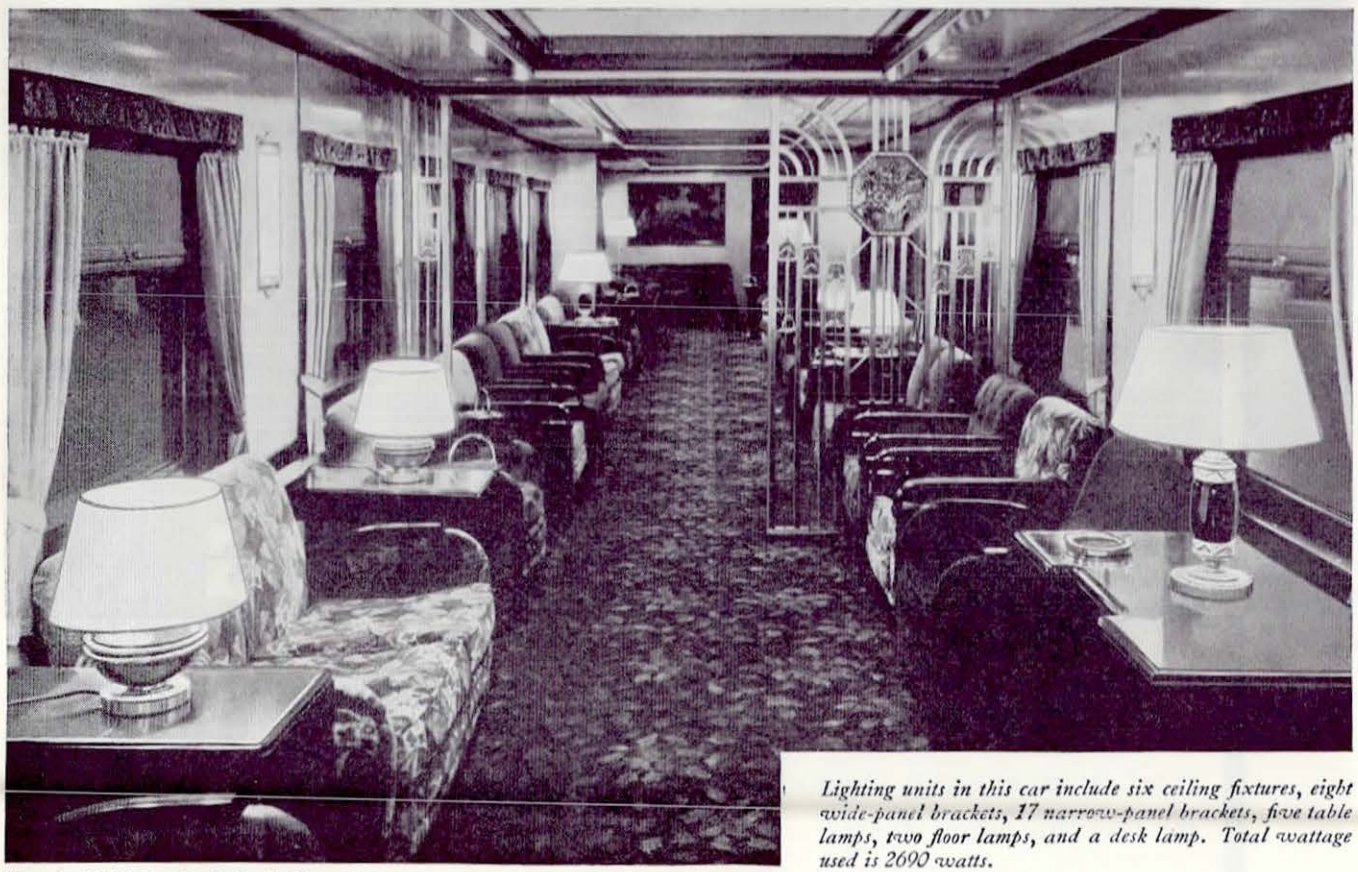
Experienced Electromet Metallurgists will gladly give you advice and opinions on the use of Stainless Steel and the low chromium steels.

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
NRA CODE
CARBIDE and CARBON BUILDING
30 EAST 42nd STREET NEW YORK, N. Y.

Electromet
Ferro-Alloys & Metals

THIS RAILWAY APPRECIATES VALUE

of comfortable lighting in lounge car



Lighting units in this car include six ceiling fixtures, eight wide-panel brackets, 17 narrow-panel brackets, five table lamps, two floor lamps, and a desk lamp. Total wattage used is 2690 watts.

Photo by W. C. Runder, St. Louis, Mo.

THIS lounge car, operated by the St. Louis-San Francisco Railway Company between St. Louis and Oklahoma City, is a good example of the effort one railroad has made to furnish comfortable lighting for its passengers. The pleasing lighting effect achieved is the result of a proper blending of light colors and suitable color combinations with a good quantity of well-diffused light.

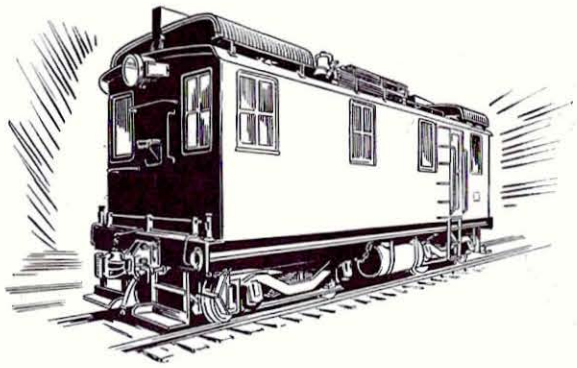
In car lighting, as well as every other phase of railway lighting, General Electric offers the benefit of its skilled engineering service. This service is yours for the asking without cost or obligation to you. Write to Engineering Department 165, General Electric Company, Nela Park, Cleveland, Ohio.

• • •

There's a MAZDA lamp of General Electric manufacture for every railway need . . . from station and yard lighting to locomotive headlight lamps. Their trade-mark (GE) on the end of every lamp is your guarantee that you are getting the most efficient incandescent lamps money can buy.

GENERAL ELECTRIC

MAZDA LAMPS



The first modern Diesel-Electric locomotive was purchased by the Central Railroad of New Jersey in October 1925. It was powered with an Ingersoll-Rand Diesel engine . . . At present there are 171 Diesel-Electric locomotives in the United States of which 111 or 65 per cent are equipped with Ingersoll-Rand Diesel engines. Ingersoll-Rand's long experience in building Diesel engines ranging from the small 300 Hp. unit to the large 1800 Hp. locomotive recently ordered by the Illinois Central places this company in a foremost position to furnish the following equipment. Full particulars sent upon request.

Diesel Electric Locomotives Switching

Wt. on Drivers	Power Plant	Starting T. E. Lb.	T. E. Lb. @6m.p.h.	T. E. Lb. @15m.p.h.
60 Tons	Single	36000	13000	4800
70 "	"	42000	17500	6000
80 "	"	48000	24000	9500
100 "	"	60000	31500	12500
110 "	Dual	66000	35500	14000
115 "	Single	69000	40000	16500
120 "	Dual	72000	48000	19500

Diesel Electric Locomotives Main Line — Freight

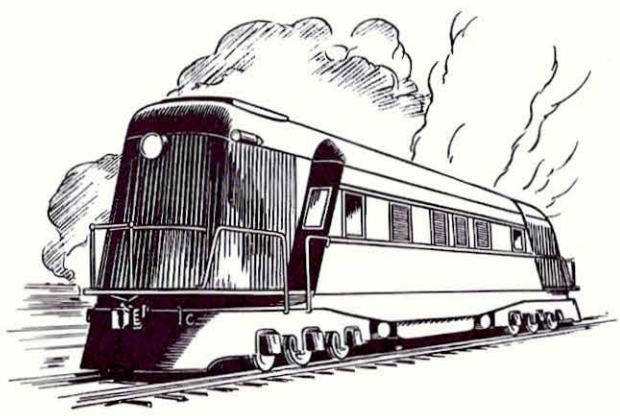
Wt. on Drivers	Power Plant	Starting T. E. Lb.	T. E. Lb. @15m.p.h.	T. E. Lb. @45m.p.h.
115 Tons	Single	69000	18000	6000
120 "	Dual	72000	21000	7100
140 "	"	84000	28000	9000
160 "	"	96000	36000	12000

Main Line — Passenger

			T. E. Lb. @30m.p.h.	T. E. Lb. @75m.p.h.
115 Tons	Single	50000	9000	3500
120 "	Dual	52000	10500	4200
140 "	"	55000	14000	5300
160 "	"	60000	18000	7000

Diesel Electric Rail Cars and Rail Car Power Plants

Engine B. H. P.	Power Plant	Starting T. E. Lb.	T. E. Lb. @30m.p.h.	T. E. Lb. @75m.p.h.
300	Single	12000	2700	1000
400	"	20000	3800	1400
535	"	20000	5300	2000
700	"	26000	6500	2600
800	Dual	40000	7600	2800
1060	"	40000	10600	4000
1400	"	52000	13000	5200
1600	"	52000	14700	6000



Ingersoll-Rand

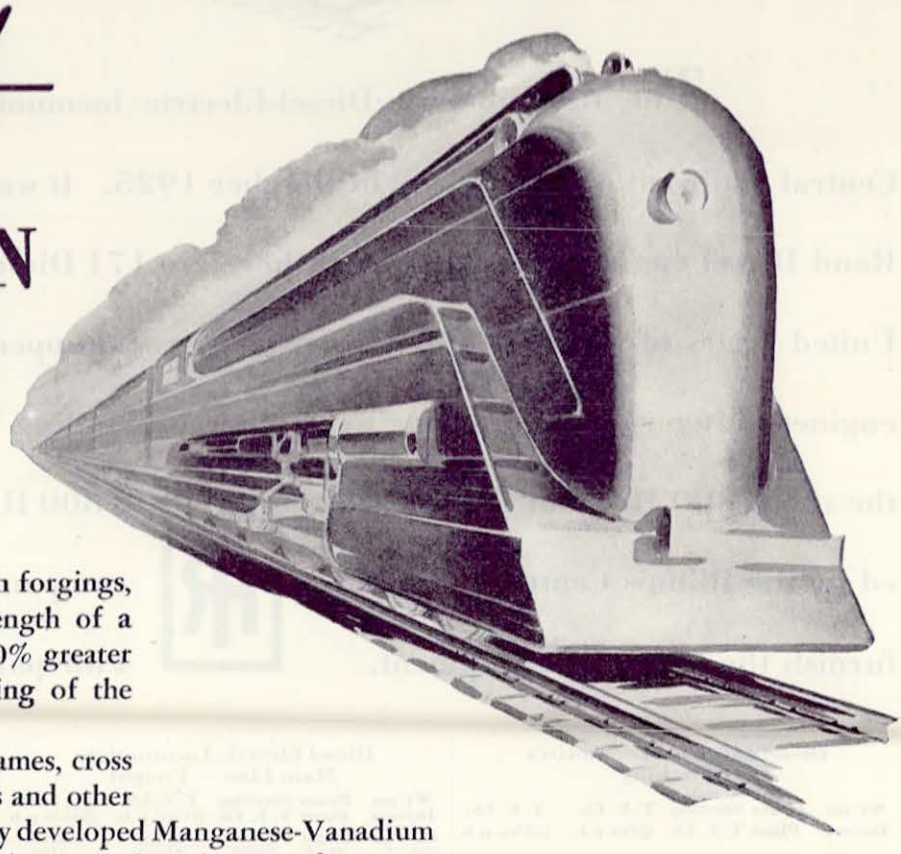
11 BROADWAY, NEW YORK

Birmingham, Boston, Buffalo, Butte, Chicago, Cleveland, Dallas, Detroit, Denver, Duluth, El Paso, Honolulu, Knoxville, Los Angeles, Manila, Newark, New Orleans, Philadelphia, Picher, Pittsburgh, San Francisco, Salt Lake City, Scranton, Seattle, St. Louis, St. Paul, Tulsa, Washington

For those New Locomotives

Specify

MODERN STEELS



When designing for light weight in forgings, bear in mind that the useful strength of a Vanadium Steel Forging is fully 50% greater than that of a carbon steel forging of the same section.

When designing main engine frames, cross heads, driving boxes, wheel centers and other cast parts, keep in mind that recently developed Manganese-Vanadium and Nickel-Vanadium Cast Steels have all the inherent advantages of Carbon-Vanadium Cast Steels plus additional characteristics which make them particularly valuable in modern power.

For equalizer and similar springs, specify Silicon-Vanadium Steel, the composition which has proved so successful in thousands of coil springs on American and French railroad cars. For leaf springs, there is no better material than time-proven Chrome-Vanadium Steel.

Metallurgists of the Vanadium Corporation will gladly assist you in designing for greater strength—with lighter weight.

VANADIUM CORPORATION OF AMERICA
120 BROADWAY NEW YORK, N. Y.
CHICAGO PITTSBURGH *Bridgeville, Pa.* DETROIT
Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories at Bridgeville, Pennsylvania

VANCORAM

FERRO-ALLOYS
of vanadium, silicon, chromium, titanium, and silico-manganese, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

VANADIUM STEELS

for strength, toughness and durability

BULLETIN 1

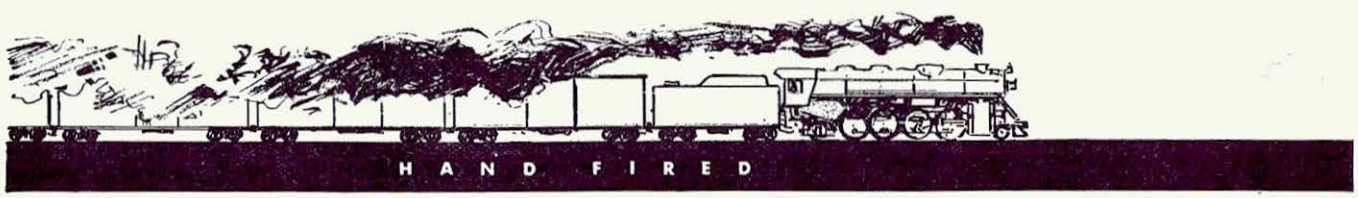
HAND FIRING

IS *Expensive* FIRING

Locomotives were hand fired in the beginning because no practical mechanical means had been developed. Saturated steam was used because we had no superheaters. Cross-head pumps supplied water to the boiler because we had no injectors. Trains were stopped by hand brakes because we had no air brakes.

It is just as logical to continue the antiquated and expensive methods of firing by hand as it would have been to have continued the use of saturated steam, cross-head pumps and hand braking.

Hand Firing is Expensive Firing. In subsequent bulletins we will show you why.



THE STANDARD STOKER COMPANY, INC.

NEW YORK • CHICAGO • ERIE

PHILADELPHIA Station, Cleveland Terminal, New York Central Viaduct, Rock Island Railroad Bridge—the number and variety of large railway undertakings for which American Bridge Company has fabricated or fabricated and erected the structural steel are more than could be mentioned or suggested here. American Bridge Company is proud to be assigned a part in the splendid demonstration of courage and foresight that is being made by American railways, in their adjustment to transportation requirements of a new age.

AMERICAN BRIDGE COMPANY

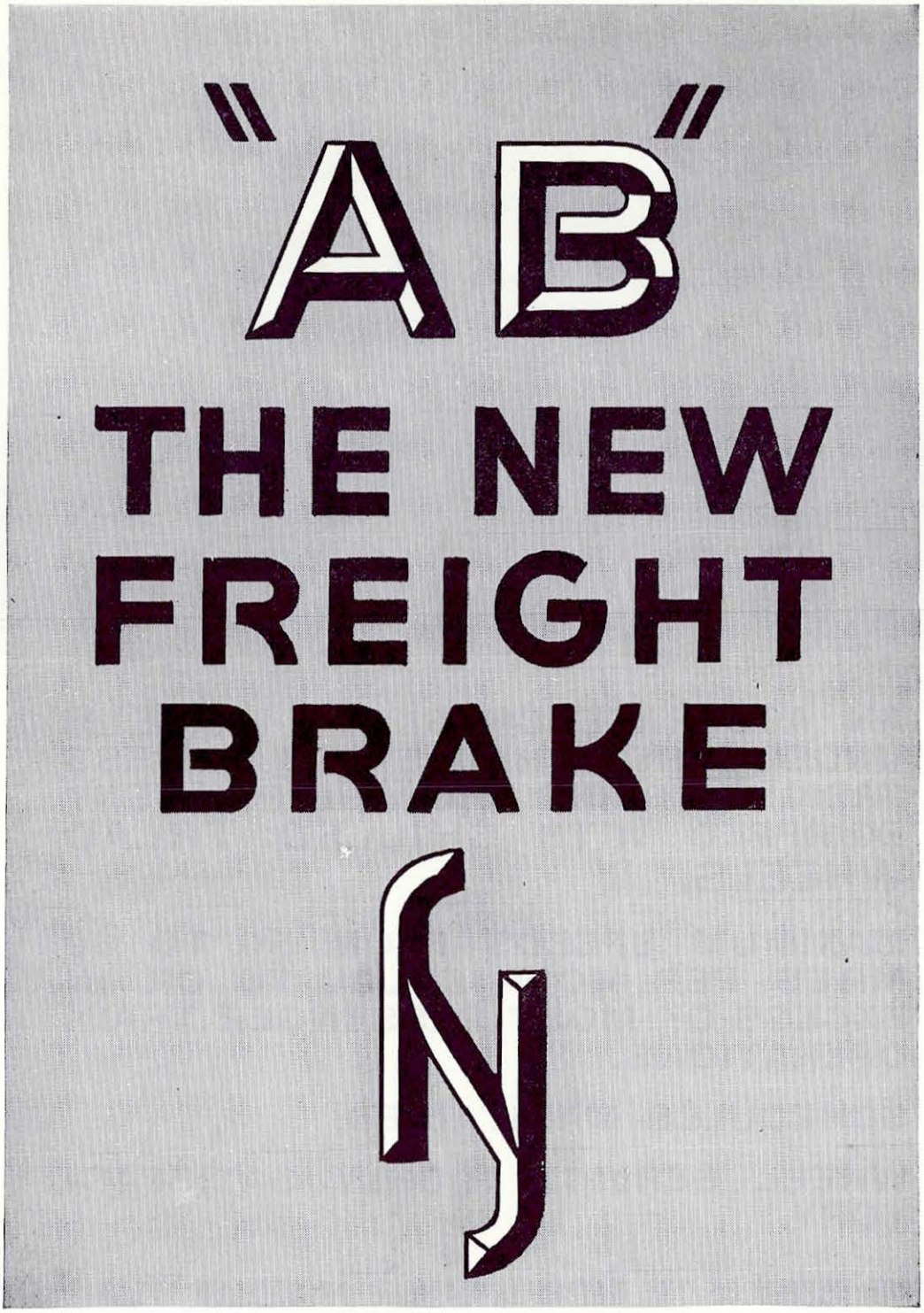
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

General Office: Frick Building, Pittsburgh, Pennsylvania

Contracting Offices: Baltimore, Boston, Chicago, Cincinnati, Cleveland, Denver, Detroit, Duluth, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City.

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco *Export Distributors:* United States Steel Products Company, New York

MEETS DEMANDS OF MODERN FREIGHT TRAINS



FOR NEW OR EXISTING EQUIPMENT
NEW EFFICIENCY INSURES MULTIPLIED ECONOMIES

THE NEW YORK AIR BRAKE COMPANY

420 LEXINGTON AVENUE • NEW YORK CITY • PLANT—WATERTOWN, N. Y.

98% CHILLED TREAD WHEELS

AN ACCURATE CHECK OF **WHEELS** UNDER CARS OF HIGH SPEED EXPRESS FREIGHT TRAINS SHOW 98 PER CENT EQUIPPED WITH **CHILLED TREAD WHEELS.**

MAXIMUM SPEEDS FROM 50 TO 60 MILES PER HOUR EQUAL TO OR IN EXCESS OF MOST PASSENGER TRAIN OPERATIONS.

SCHEDULES MAINTAINED.

WHEEL SERVICE HIGHLY SATISFACTORY.

THE FOOD SUPPLY OF THE NATION IS CARRIED ON CHILLED TREAD WHEELS

GRIFFIN WHEEL COMPANY

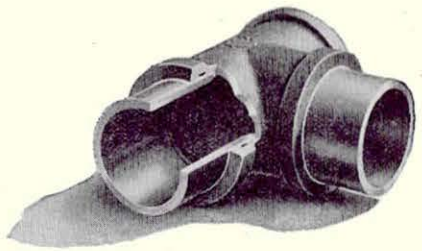
410 NORTH MICHIGAN AVENUE **CHICAGO, ILLINOIS**

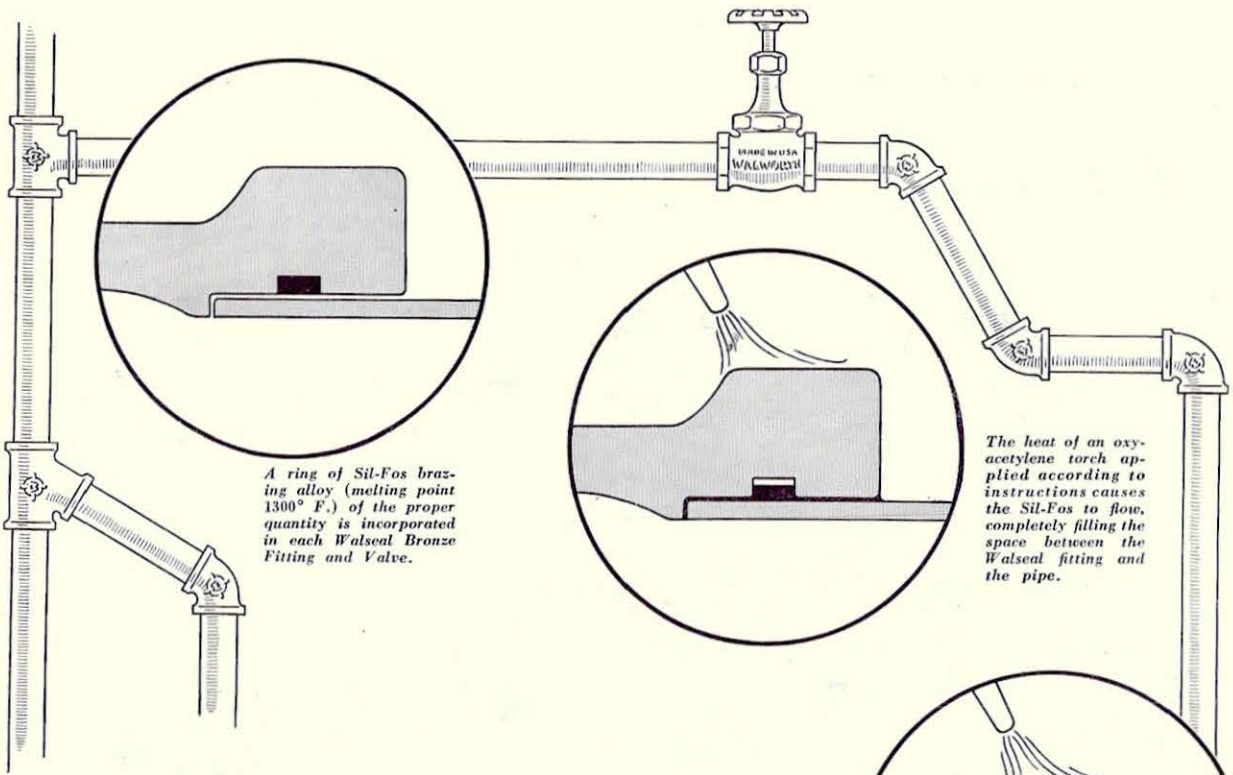
Plants

Chicago	Boston	Cincinnati	Kansas City	Denver	Los Angeles
Detroit	Cleveland	St. Paul	Council Bluffs	Salt Lake City	Tacoma

WALSEAL

THE ONE PIECE BRONZE PIPE LINE





A ring of Sil-Fos brazing alloy (melting point 1300° F.) of the proper quantity is incorporated in each Walseal Bronze Fitting and Valve.

The heat of an oxy-acetylene torch applied according to instructions causes the Sil-Fos to flow, completely filling the space between the Walseal fitting and the pipe.

Sil-Fos impregnates both pipe and fitting making "a one piece pipe line."

The Walseal joint is brazed (not soldered). The heat required to melt the Sil-Fos not only causes it to flow so as to completely fill its allotted space between fitting and pipe, but also causes the Sil-Fos to impregnate both the fitting and pipe so that they become virtually one piece of metal—"a one piece pipe line."

Walseal Bronze Fittings are available in sizes ¼" to 8"; Walseal Bronze Flanges 1½" to 12"; also Walseal Bronze Valves in various types.

WALWORTH

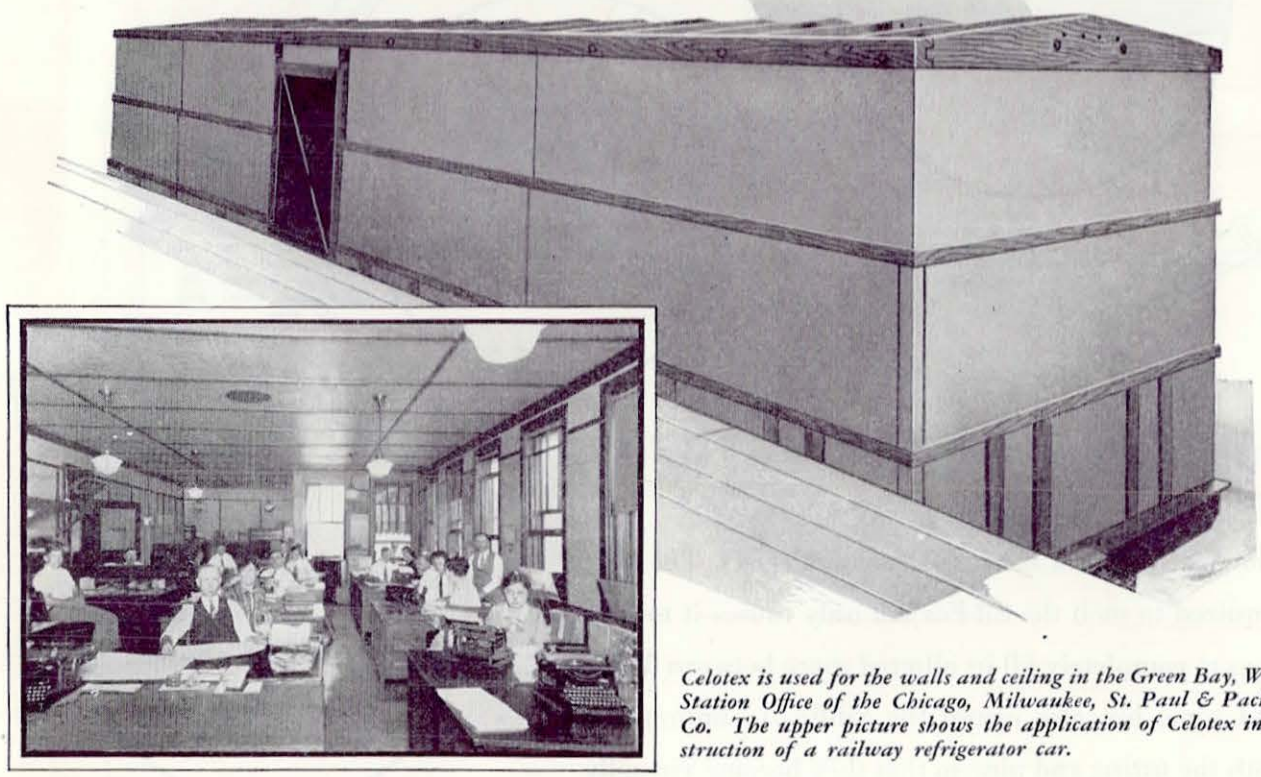
VALVES FITTINGS and TOOLS
Backed by 91 Years Service

WALWORTH COMPANY
60 EAST 42nd STREET, NEW YORK

DISTRIBUTORS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

Railroads Have Many Uses For CELOTEX

as refrigerator car insulation · as an interior finish for offices and workrooms · as sheathing · and as a plaster base



Celotex is used for the walls and ceiling in the Green Bay, Wisconsin, Station Office of the Chicago, Milwaukee, St. Paul & Pacific R. R. Co. The upper picture shows the application of Celotex in the construction of a railway refrigerator car.

Wherever rehabilitation, repairing or remodeling is planned, Celotex Cane Fibre Board provides an economical, permanent and efficient material.

Today, when railroads are modernizing their refrigerator car equipment, Celotex is widely used as an insulation. Celotex applied to walls and ceilings of cars lowers handling costs and reduces spoilage of perishable foodstuffs. Since it replaces other materials, it is not an "extra."

Celotex insulation is highly efficient. One inch is as effective as three 1″ boards; nine ½″ layers of plaster board; a 15″ wall of common brick; a 16″ clay tile wall; or a 36″ concrete wall. Its strength and toughness resist the stresses and strains of railway service. It adds no excessive weight; is integrally waterproofed.

Acousti-Celotex for Sound Correction

Acousti-Celotex, a highly efficient sound absorbing material, finds many uses in offices, buildings and cars where the control of noise is necessary to promote comfort and efficiency. Acousti-Celotex may be painted and decorated without impairing its acoustical properties.

As an interior finish in building new, or remodeling old offices and workrooms, Celotex may be paneled, grooved, carved or stenciled. It is easily cleaned with brush or vacuum. If painted, it may be washed.

As a plaster base, Celotex Lath replaces wood or metal lath; provides insulation against outdoor temperatures; saves fuel and increases comfort; eliminates lath marks, and reduces plaster cracks.

As a sheathing, Celotex combines (1) strength, (2) durability, (3) high insulating efficiency, (4) permanent resistance to decay.

All Celotex Cane Fibre Products are manufactured under the Ferox Process (patented) and therefore effectively resist damage by Fungus Growth, Dry Rot, and Termites (White Ants).

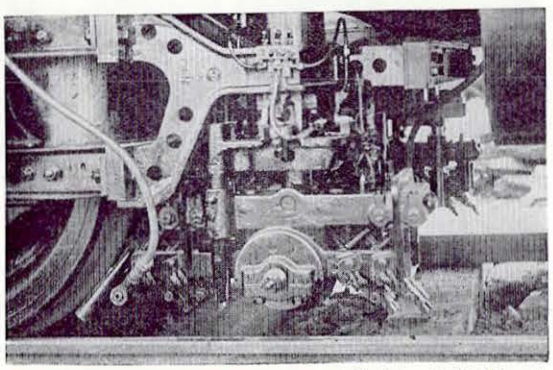
Specify Celotex Products and be sure it is Celotex you get. For further information write to:

THE CELOTEX COMPANY
919 No. Michigan Ave. Chicago, Ill.

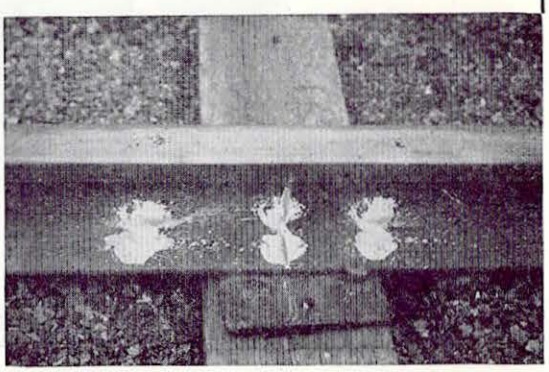
CELOTEX
BRAND
INSULATING CANE BOARD
(Reg. U. S. Pat. Off.)
BUILDS · INSULATES
DECORATES
NRA CODE

4 VITAL IMPROVEMENTS *to Sperry Detector Cars* PERMIT OPERATION OF...

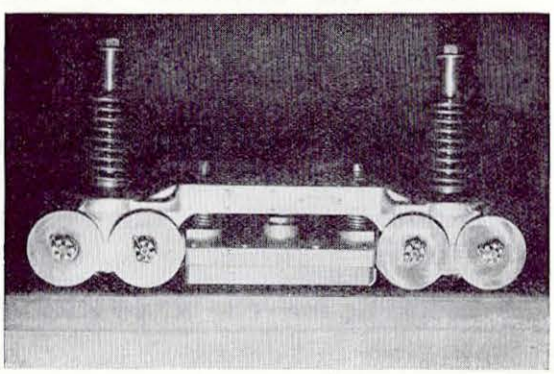
FAST TRAINS OVER SAFE TRACK



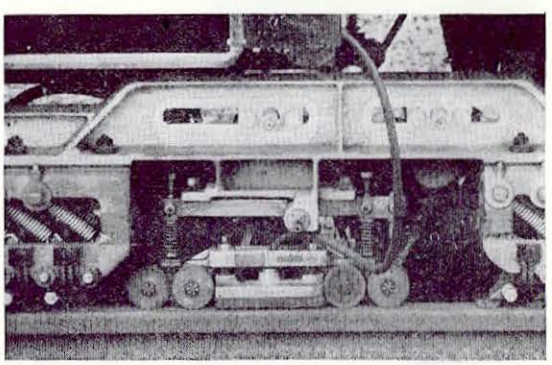
1. PRE-ENERGIZATION Added circuit (3rd Brush) aligns fissure polarity, otherwise large as well as small fissures missed. Simplifies operation. Increases accuracy as much as 20 per cent!



2. SHORT-SPOT PAINT SYSTEM Gives individual mark for each defect. Old-type systems produced long marks, overlapped on defects close together. Fissures missed. New system increases operator efficiency.

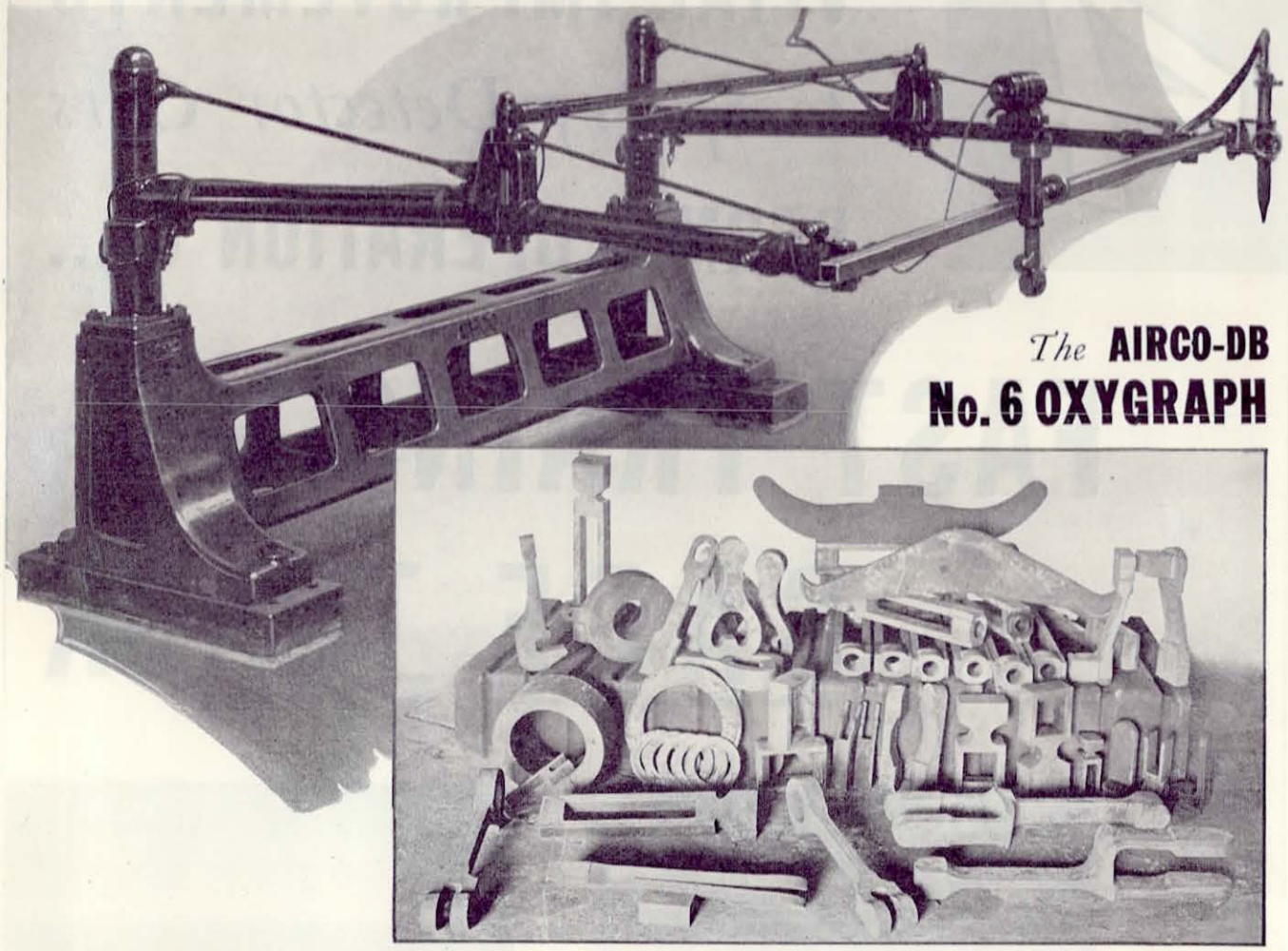


3. MULTI-TANDEM SEARCHING UNIT
Staggered coils detect fissures located anywhere in head, reduce false indications. Results in service:—twice as many fissures as found by old type.



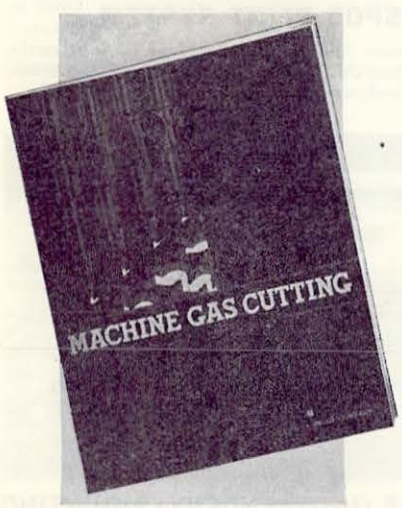
4. FLEXIBLE (INDEPENDENT) MOUNTING
Allows searching unit to follow rail contour, thus maintaining constant air gap between searching coils and rail. More accuracy . . . more fissures.

MORE THAN A MACHINE



The **AIRCO-DB**
No. 6 OXYGRAPH

Railroad Shop Executives are invited to write for this illustrated, 92-page MACHINE GAS CUTTING book which fully tells the story of the process and machines.



A fast, economical process for making locomotive and car parts . . . .

The OXYGRAPH is a dividend-paying investment for any railroad shop. It earns the dividends by making parts, such as those shown, in a fraction of the time they could be produced by any other method, and at a fraction of the cost. It will reproduce automatically from cam or templet or, with manual guidance, from a blue print or simple outline drawing.

WRITE for the OXYGRAPH Bulletin. It gives full details.

Anything and Everything for GAS and

SPEED UP REBUILDING and HEAT TREATING

of rail ends, frog and switch points

with the new

AIRCO TWO-FLAME TIP

The fast AIRCOWELDING Process has already greatly reduced the time required to build up rail ends. But now you can AIRCOWELD even faster. The new TWO-FLAME TIP makes this possible. Attach it to the torch handle in place of the regular tip and you have *two torches in one*, with practically double the heating and welding capacity. Obviously this tip will cut heat treating time as well, because the required temperature is reached in less time and with less dissipation of heat.

Full details about AIRCOWELDING and about the TWO-FLAME TIP will be supplied on request.

NRA MEMBER U.S. WE DO OUR PART

AIR REDUCTION SALES CO.

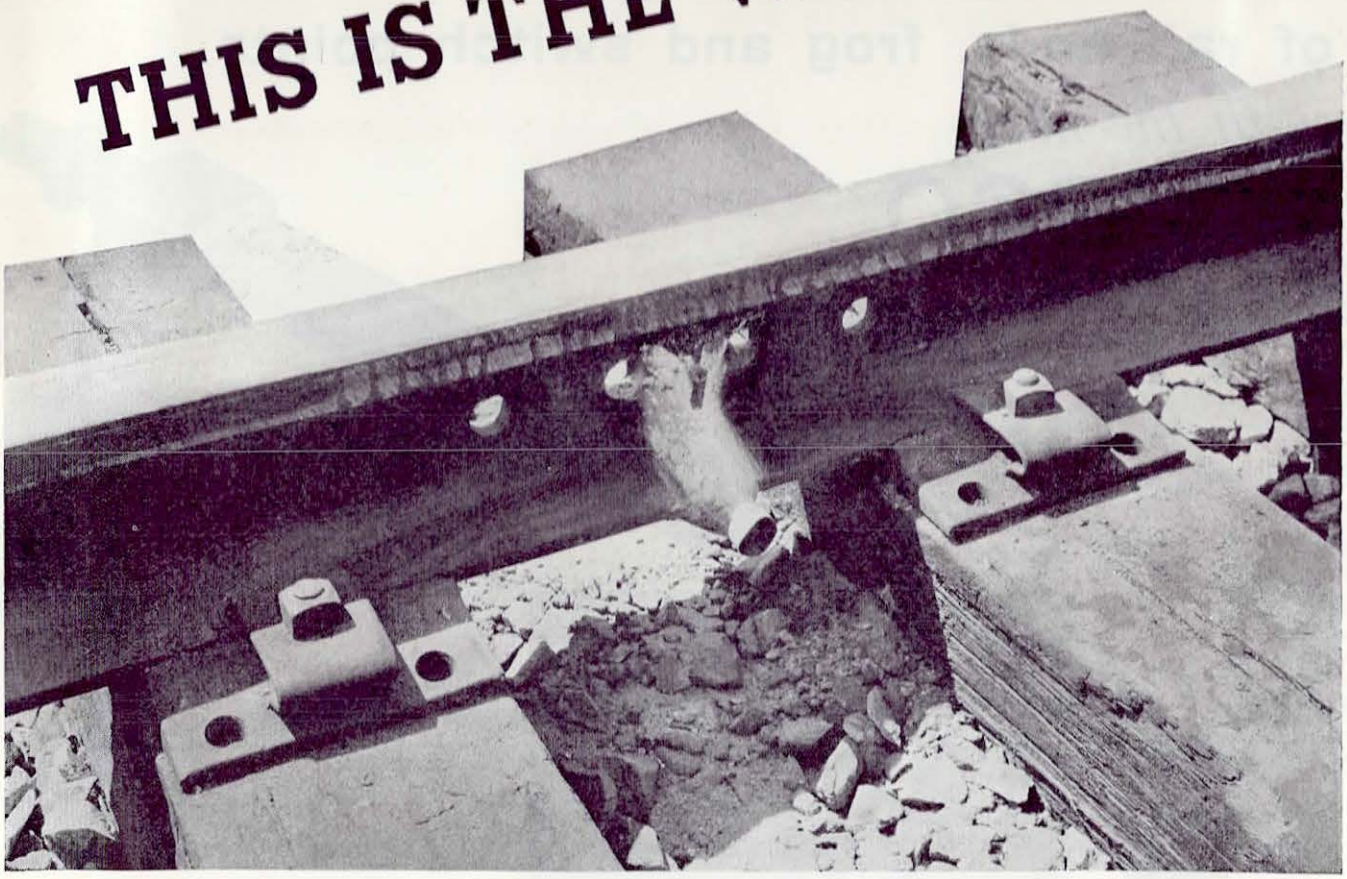
General Offices: 60 East 42nd St., New York, N. Y.

DISTRICT OFFICES and DISTRIBUTING STATIONS in PRINCIPAL CITIES

AIRCO OXYGEN, ACETYLENE, NITROGEN, HYDROGEN . . . . AIRCO-NATIONAL CARBIDE
AIRCO WELDING and CUTTING APPARATUS and SUPPLIES . . . . AIRCO-WILSON ARC WELDING MACHINES

ELECTRIC WELDING and GAS CUTTING

THIS IS THE WAY



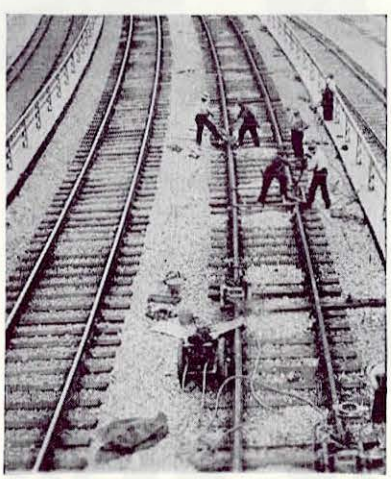
to banish Joint Maintenance

Continuous rail...rail in long stretches, unbroken by troublesome joints...is no longer a remote ideal. It is now an accomplished fact, made possible by Thermit Pressure Rail Welding.

European and Australian railroads have been Thermit Welding rails on main line track successfully for many years. The economies effected have been enormous. In America, continuous Thermit Welded rails up to 2800 feet in length are giving completely satisfactory service. The welding of this track has largely eliminated track lining and surfacing, and has resulted in greatly reduced maintenance.

The Thermit Pressure Rail Weld, developed especially for railroad use, combines a pressure butt weld of the head of the rails with a perfect fusion weld of the base and web. This weld can be installed by your own track forces at a cost comparable with that of a bolted joint. And, with Thermit Rail Welding, the first cost is the last.

Let us give you the complete story of Thermit Rail Welding.



Thermit Rail Welding on the Delaware & Hudson Railroad at Albany, N. Y.

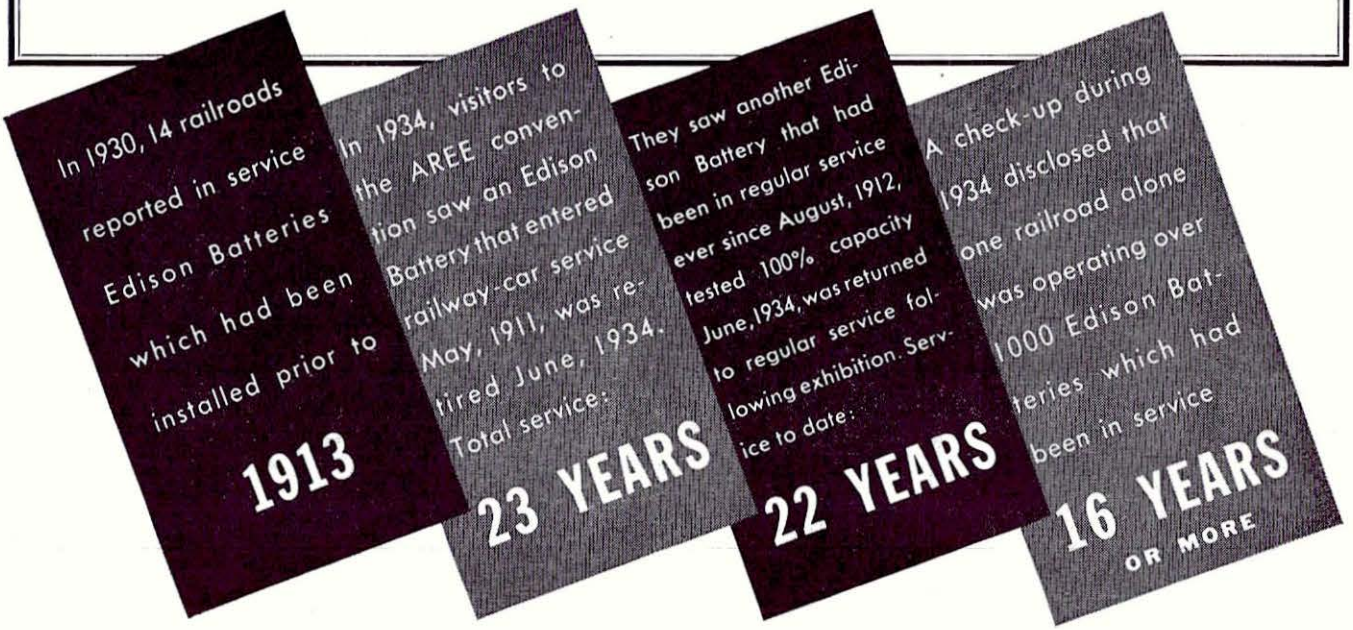
THERMIT Rail WELDING

METAL & THERMIT CORPORATION · 120 BROADWAY, NEW YORK

ALBANY · CHICAGO · PITTSBURGH · SO. SAN FRANCISCO · TORONTO

AIR CONDITIONING,

even more than Car Lighting, needs Batteries of the Stamina that Makes such Records Possible


In 1930, 14 railroads reported in service Edison Batteries which had been installed prior to
1913
In 1934, visitors to the AREE convention saw an Edison Battery that entered railway-car service May, 1911, was retired June, 1934. Total service:
23 YEARS
They saw another Edison Battery that had been in regular service ever since August, 1912, tested 100% capacity June, 1934, was returned to regular service following exhibition. Service to date:
22 YEARS
A check-up during 1934 disclosed that one railroad alone was operating over 1000 Edison Batteries which had been in service
16 YEARS
OR MORE

Examples of the long life Edison Batteries deliver in car lighting are familiar to all railroad men. A few are repeated here to drive home the point that the same stamina is even more important in air conditioning.

Here a battery takes more punishment. Without built-in stamina it is likely to prove over-expensive and under-dependable.

Only the nickel-iron-alkaline battery has the supreme stamina necessary to the utmost in dependable performance and the utmost in long life. Long life is the best assurance of economical operation because it means low depreciation; and depreciation, except in the obsolescent Planté, is the largest item of operating cost.

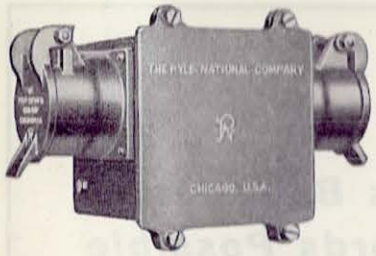
The stamina of the Edison Battery is a natural result of *steel* construction, an electrolyte that is a *preservative* of steel and a *correct* electrochemical principle.

IMPORTANT

The structural and electrochemical advantages described in this advertisement are exclusive with the Edison Battery—the only nickel-iron-alkaline battery manufactured in the United States. They help explain why it is that the only way to enjoy Edison performance is to use Edison Batteries.

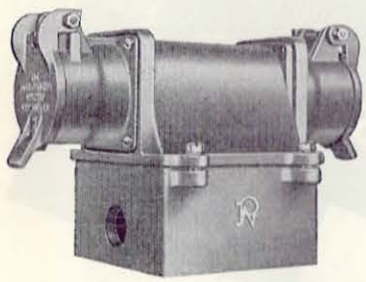
EDISON STORAGE BATTERY

● *DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY*

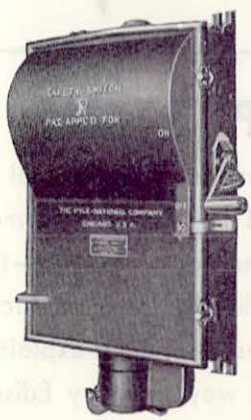


Service receptacle for mounting at side of platform. Single or double outlet types.

Service receptacle for mounting between tracks. Single or double outlet types.

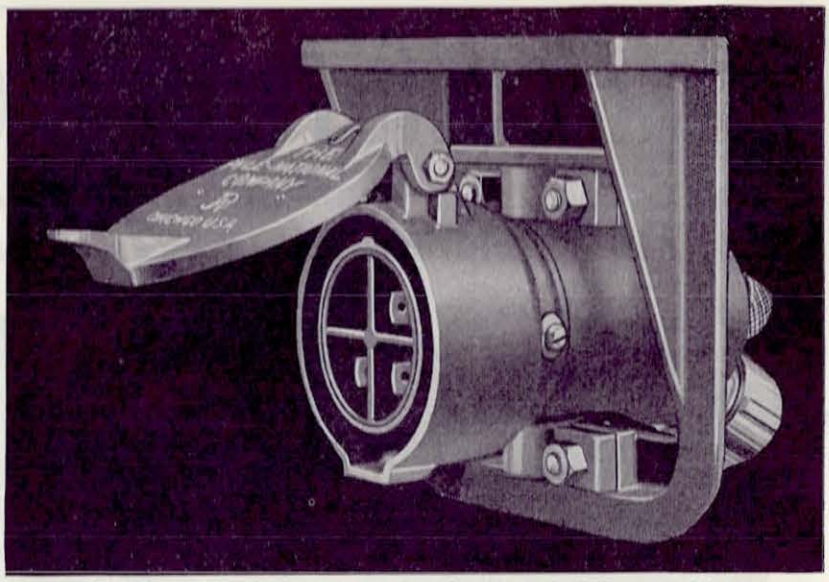


Service receptacle for mounting between tracks. Single or double outlet types.



Service receptacle with fused, interlocked safety switch, for overhead wiring

Service receptacle for wall or post mounting



Swivel bracket "QuelarC" car receptacle (male), ARA and AREE approved design

Improved

"QUELARC" Plugs and Receptacles

The "QuelarC" line of circuit-breaking plugs and receptacles now includes new types and improved construction to meet the most severe requirements of all types of air conditioning services.

Refinements in design and construction based upon the most extensive experience with yard and car fittings for air conditioning power supply are presented in the new "QuelarC" line.

SUPER-INSULATION — Extra protection against breakage is provided by the new *super-tough* bakelite insulation, and a longer support for the plugs provided within the receptacles. Super-insulation is standard throughout the entire line.

SIMPLER WIRING — An improved relay contact construction in the swivel-bracket car receptacle has fewer parts, and greatly simplifies wiring.

SMOOTH-EXTERIOR, LIGHT WEIGHT PLUGS—Car-receptacle plugs are lighter in weight, and have been re-designed to provide smooth exterior and better grip. They are insulated with the new *super-tough* bakelite.

NEW TYPES—Fused plugs, new types of yard and platform service receptacles, and fused safety switches with interlocking receptacles, complete the "QuelarC" line—permitting selection of correct types for current supply to cars for any AC air conditioning equipment.

NEW BULLETIN NO. 192—The improved "QuelarC" plugs and receptacles and their application to air conditioning services are fully described in new Bulletin No. 192. Copies will be sent upon request.

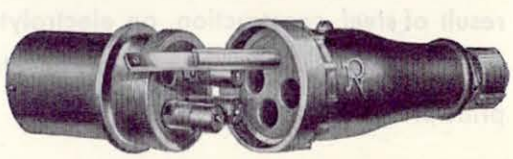
THE PYLE-NATIONAL COMPANY

1334-58 North Kostner Avenue - Chicago, Illinois

Branch Offices at *New York, St. Louis, St. Paul, San Francisco, Detroit.* Export Department, *International Railway Supply Co., New York.* Canadian Agents, *The Holden Co., Ltd., Montreal, Toronto, Winnipeg, Vancouver*

Plug (male) for service outlet receptacles

"QuelarC" female plug for car receptacles



Fused plug (male) for service outlet receptacles

Read the Condition of Your Boiler Water

Know the condition of your boiler water by reading the results of concentration and titration tests. This permits exact control of blowdown and treatment dosage adjustment.

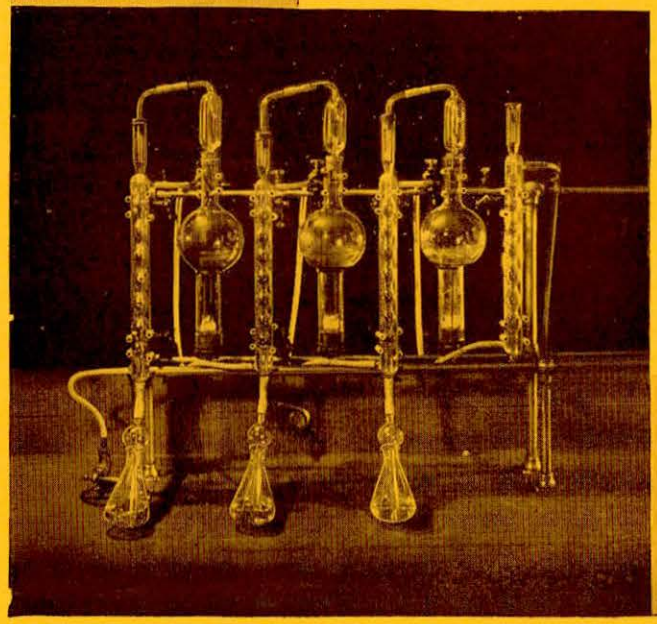
The Dearborn Method, combining field and laboratory control tests, assures the best and most economical results in the treatment of boiler feed water.

This service is available on your railroad.

A survey of operating conditions on your lines together with the necessary analytical reports and treatment recommendations, is made without obligation.

Specialists in Boiler Feed Water Treatment since 1887.

New Reduction Method of Determining Nitrates. DEARBORN LABORATORIES



DEARBORN CHEMICAL COMPANY

310 S. MICHIGAN AVE. CHICAGO

205 EAST 42nd STREET NEW YORK

CANADIAN OFFICE and FACTORY TORONTO

Dearborn

TRADE MARK REGISTERED

"400 Miles in 400 Minutes"

SYPHON EQUIPPED

One of the steam locomotives of the Chicago and North Western Railway Company which pulls the fastest scheduled train on the American Continent on the run between Chicago-Milwaukee and St. Paul-Minneapolis. Syphon equipped.

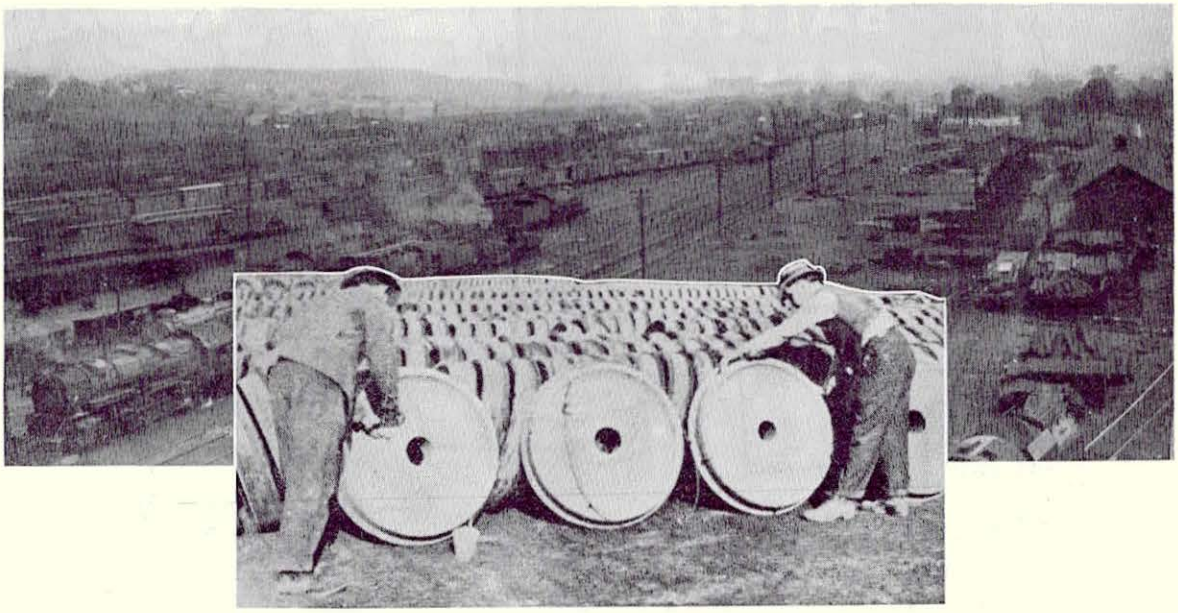
During 1934, 93% of the new steam locomotives ordered by railroads in the United States were Syphon Equipped and, including existing power, a total of 234 Locomotives were equipped with 549 Syphons.

14,957 SYPHONS
have been applied to
6,837 LOCOMOTIVES

Increased Heating Surface
Increased Circulation
Improved Performance
Reduced Maintenance • Fuel Economy
Safety in Case of Low Water

LOCOMOTIVE FIREBOX COMPANY
NEW YORK CHICAGO MONTREAL

CHILLED TREAD WHEELS ARE IN USE UNDER MORE THAN 90% OF THE FREIGHT CARS IN THE UNITED STATES AND CANADA



MEMBERS

Albany Car Wheel Co.
American Car & Fdry. Co.
Bass Fdry. & Machine Co.
Canada Iron Foundries, Ltd.
Canadian Car & Fdry. Co.
Central Car Wheel Co.
Cleveland Production Co.
Dickson Car Wheel Co.
Dominion Wheel & Fdries., Ltd.
Griffin Wheel Co.
Hannibal Car Wheel & Fdry. Co.
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Marshall Car Wheel & Fdry. Co.
Maryland Car Wheel Co.
Mt. Vernon Car Mfg. Co.
New Orleans Car Wheel Co.
New York Car Wheel Co.
Pullman Car & Mfg. Corp.
Ramapo Fdry. & Wheel Works
Reading Car Wheel Co.
Southern Wheel Co.
Tredegar Iron Works

Their superior quality is the reason they are in use on over 90% of the freight cars in the United States and Canada.

The Association of Manufacturers of Chilled Car Wheels has, through endless research, developed the wheels required for your particular purpose.

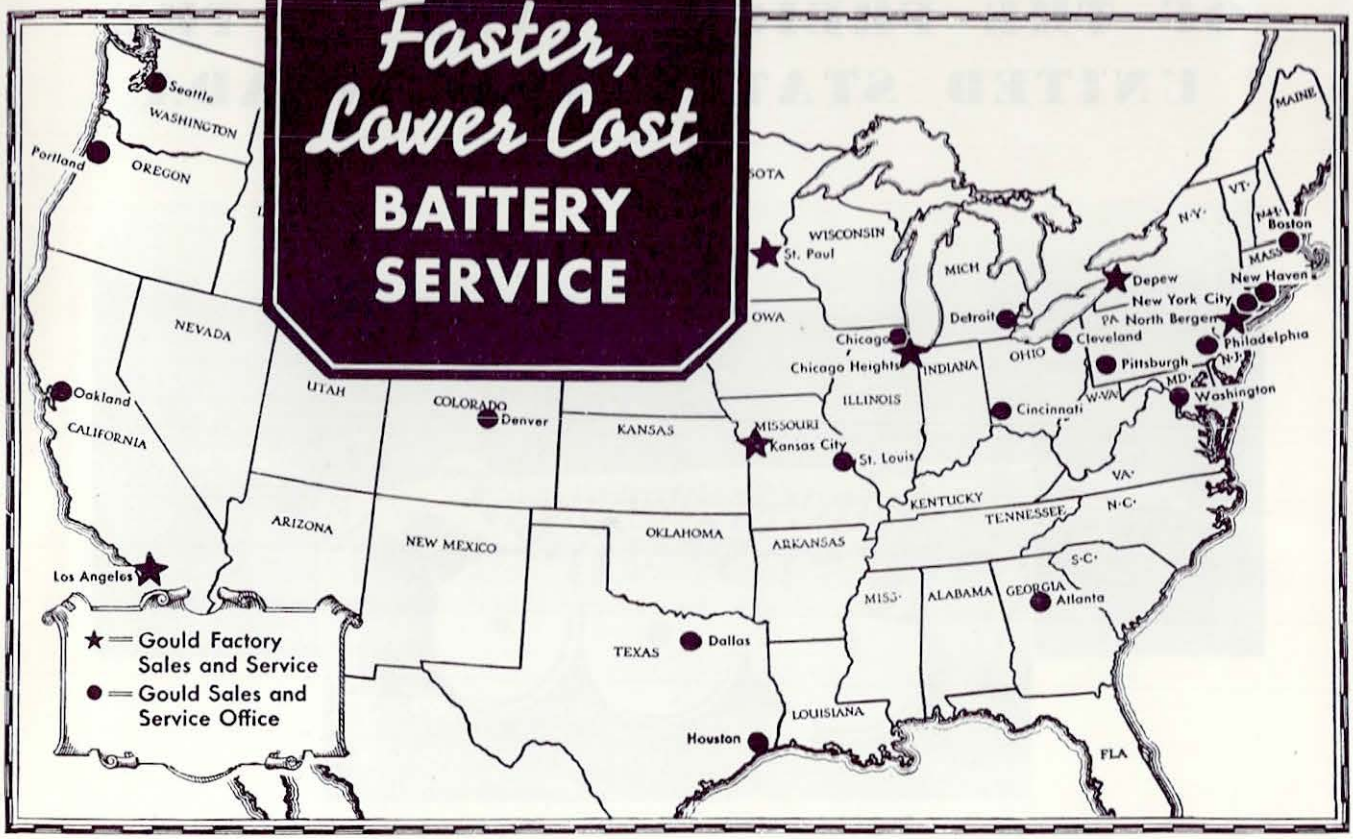
Our members will gladly furnish information as to why the Chilled Car Wheel merits such universal favor.

ASSOCIATION

OF MANUFACTURERS OF CHILLED CAR WHEELS

332 S. MICHIGAN AVE., CHICAGO, ILLINOIS

TO GIVE YOU *Faster, Lower Cost* BATTERY SERVICE



GOULD OPERATES NATION-WIDE NET-WORK OF FACTORIES... SALES AND SERVICE OFFICES

WHEN you want technical data on battery installations, and want it P. D. Q.... when you require the assistance of a skilled battery engineer... at once, then you'll discover there's no equal to the service and economy of the 6 Gould Factories... the 24 Gould sales and service offices. Strategically located, they give over-night service to practically every city in this country.

That's one reason why leading railroads use Gould Batteries for Signal Service, Car Lighting, Air Conditioning, Baggage and Freight Trucks, Tractors, Electric Locomotives, Diesel and Gas-Electric Locomotives, Generating and Sub-Station Service, Multiple Unit Control Lift Bridges and Railroad Marine Applications.

Gould Engineers will gladly help you select the type of battery best suited for your individual requirements... Plante' Paste... Armored Kathanode ... or Dreadnaught. Write your nearest office for this free service and for free copies of the New Railroad Battery Manuals, just published. The Gould Service Map, under your glass desk top or in your file, can save you time and money. Why not put it to work, now?

Here Is Your Nearest Gould Office

Atlanta, Ga.	1060 Murphy Ave. S.W.
Boston, Mass.	40 Stanhope Street
Chicago, Illinois	32 West Randolph Street
Chicago Heights, Ill.	12th St. and McKinley Ave.
Cincinnati, Ohio	633 Elsinore Avenue
Dallas, Texas	3605 Main Street
Denver, Colorado	2014 Market Street
Depew, N. Y.	35 Neoga Street
Detroit, Michigan	525 East Lafayette Blvd.
Houston, Texas	3905 South Capitol Street
Kansas City, Mo.	1601 Oakland Avenue
Los Angeles, Calif.	2678 Lacy Street
New Haven, Conn.	84 Howe Street
New York, N. Y.	768 Tenth Avenue
North Bergen, N.J.	955-39th Street
Oakland, Calif.	1635 Poplar Street
Philadelphia, Pa.	214 Harrison Building
Pittsburgh, Pa.	2500 Jane Street
Portland, Oregon	351 East Madison Street
St. Louis, Missouri	Railway Exchange Building
St. Paul, Minnesota	1704 Roblyn Avenue
Seattle, Wash.	2422 Elliott Avenue
Washington, D. C.	1108 Sixteenth St., N. W.

GOULD STORAGE BATTERY CORPORATION OF DEPEW, NEW YORK

Statistics SHOW

● The oxy-acetylene process contributes greatly to the economies in operation which all roads are striving to accomplish. Its leading applications include:

RECLAMATION of worn materials and parts • REPAIRS at reduced cost • DEMOLITION of obsolete equipment • RAIL END WELDING to prolong the life of rails, to cut maintenance cost and to improve riding quality • HEAT-TREATING RAIL ENDS to postpone batter • FABRICATION of new parts by oxy-acetylene machine cutting.

● The Oxweld Railroad Service Company shows you how to accomplish these applications economically. Are you taking full advantage of the up-to-date welding and cutting service we supply?

OXWELD RAILROAD SERVICE

THE OXWELD RAILROAD SERVICE COMPANY

Unit of Union Carbide and Carbon Corporation

UCC

CHICAGO NEW YORK

NRA CODE

19 Railroads

Leading American Railroad installs 60 of these Sturtevant Railway Air Conditioning Units.

Over 2200 passenger cars... a large percentage of cars now air conditioned... use Sturtevant Fans and Cooling Coils, individually or in combination. This widespread use of Sturtevant Air Conditioning by 19 of the larger railroads throughout the country is based on the advantages they found in Sturtevant Air Conditioning Equipment.

1. This equipment is backed by Sturtevant's 70 years of Air Engineering experience...
2. It is built with 20 years experience in complete air conditioning for comfort purposes.
3. It is service tested in design and construction.

To the buyer of Railway Air Conditioning equipment, this background means he can install Sturtevant Equipment with confidence in its ability to deliver the maximum efficiency with dependable service.

An inquiry will bring more complete information.

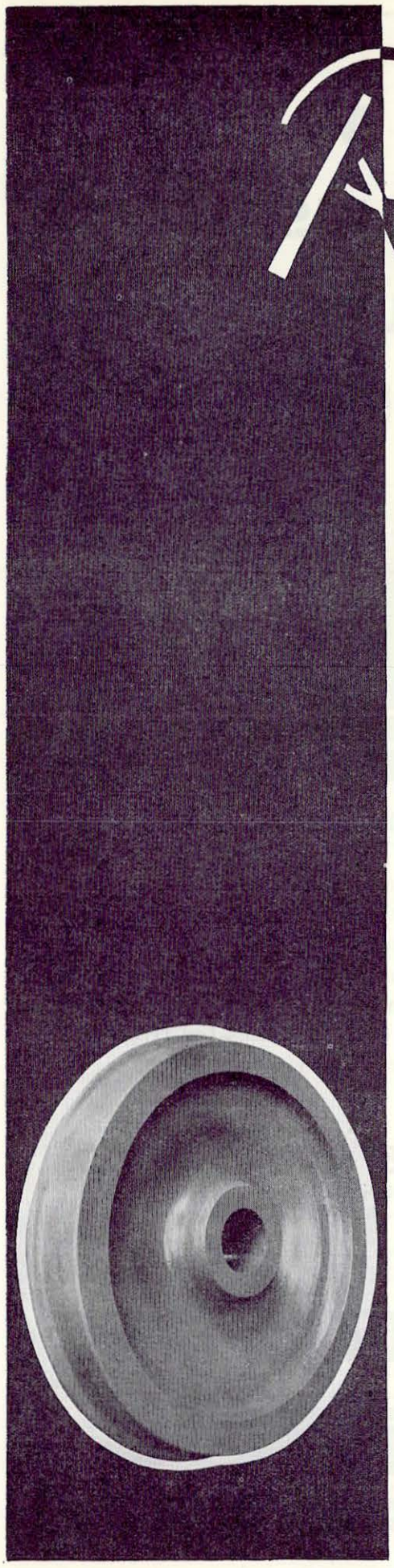
★

B. F. STURTEVANT COMPANY

Main Offices: Hyde Park, Boston, Mass.

Chicago, Ill., 400 N. Michigan Ave.; San Francisco, Cal., 681 Market St. *Branch Offices in Other Cities*

PIONEERS IN AIR CONDITIONING FOR OVER 20 YEARS



RETURNING PROSPERITY ROLLS *in* EASIER ON GOOD WHEELS

LOOKING forward to that time when increased freight and passenger traffic will necessitate further expenditures for wheels, we suggest your consideration of "Standard" Wrought Steel Wheels for use under your locomotives, tenders, and cars. Thirty years of experience, research and improvement are *back* of Standard wheels—years of dependable, safe and economical wheel performance are *ahead* for you, by the use of "Standard" wheels. Let us discuss your wheel problems with you.

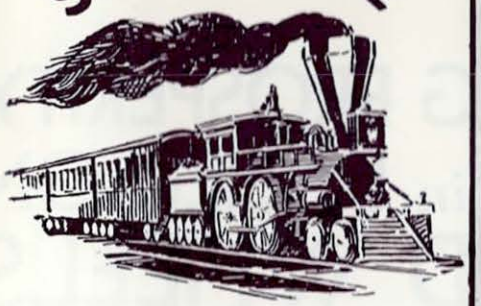
STANDARD STEEL WORKS COMPANY

SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

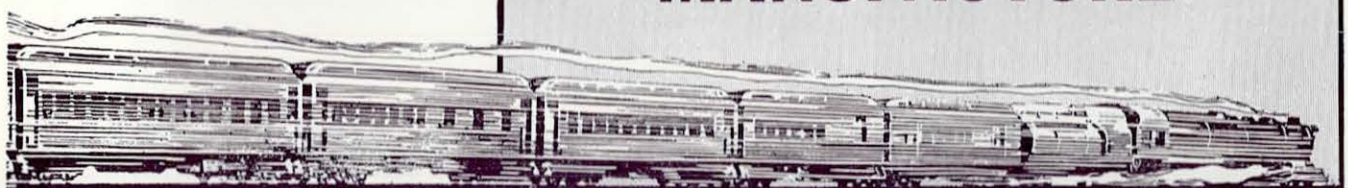
GENERAL OFFICES & WORKS - - - BURNHAM, PA.

NEW YORK CHICAGO PORTLAND AKRON
PHILADELPHIA ST. LOUIS SAN FRANCISCO

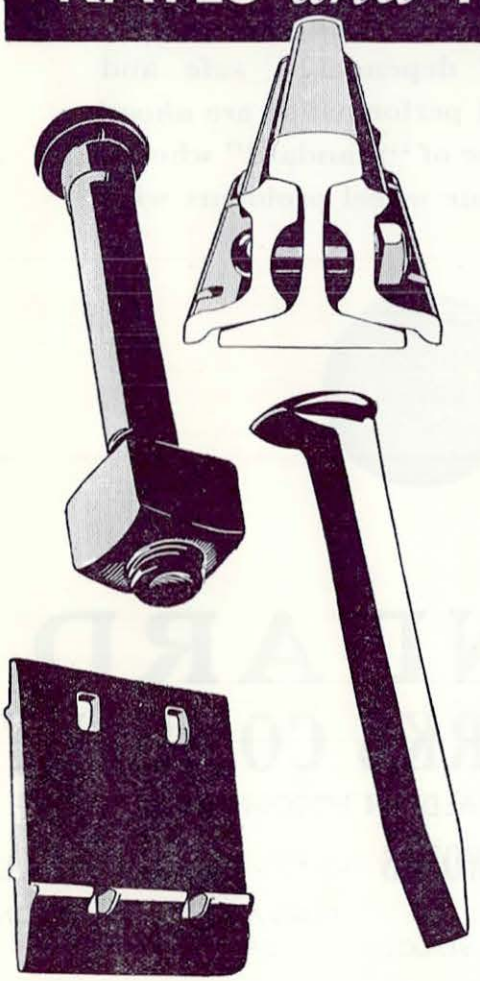
SINCE 1902



QUALITY MATERIALS
DILIGENT INSPECTION
EXCELLENCE OF
MANUFACTURE



TENNESSEE
RAILS *and* TRACK ACCESSORIES



COMBINATION of these factors, commends Tennessee rails and accessories to all who are concerned with laying and maintaining railway tracks designed for modern traffic. Our rail mills produce a full range of standard and light rails. In our accessory plants we manufacture track bolts, track spikes, tie plates (both hot and cold-worked) and rail joints, also special twin tie plates for frogs and switches. Your inquiries are invited.

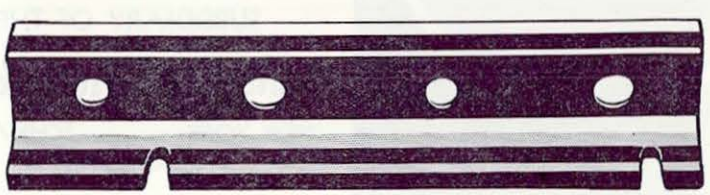
TENNESSEE
COAL, IRON & RAILROAD CO.

General Offices: Brown-Marx Building, Birmingham, Ala.
District Offices in Principal Cities.

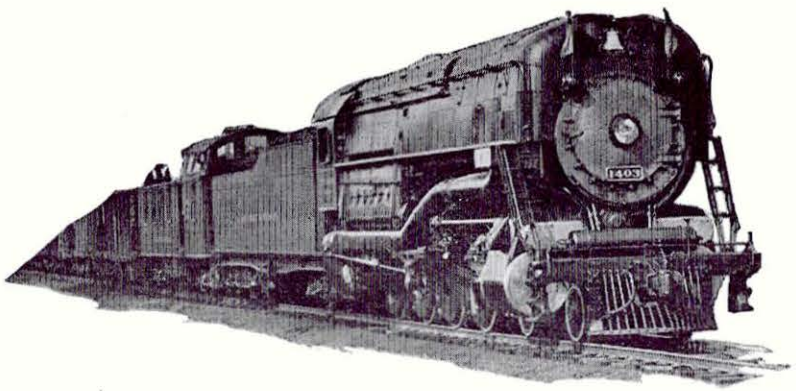
Rails and Track Accessories are also produced by Carnegie Steel Company, Pittsburg and Illinois Steel Company, Chicago.

Pacific Coast Distributors—Columbia Steel Company, San Francisco, Cal. Export Distributors—United States Steel Products Company, New York.

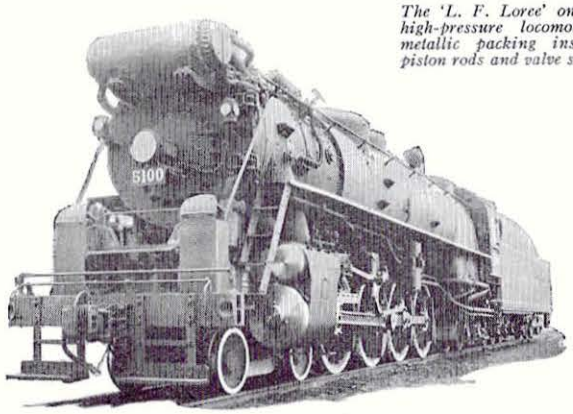
United States Steel Corporation Subsidiaries



MEETING MODERN LOCOMOTIVE REQUIREMENTS— PLUS—



The 'L. F. Loree' one of the latest high-pressure locomotives. King metallic packing installed on all piston rods and valve stems.



Lehigh Valley high-pressure locomotive, equipped with King metallic packing on piston rods, valve stems and air pumps, and with King sanders.

King Metallic Packing on the piston rods and valve stems of the largest and most powerful locomotives in the country has proven its ability to meet high pressure and severe operating conditions on modern power. Likewise the King Mechanical Lubricator, King Air Pump Packing, King Sander, and other King products are contributing to the efficient and economical operation of motive power so necessary today.

The consistent and superior performance of King products is the result of continuous improvement in design and workmanship, keeping pace with mechanical department requirements and improvements in locomotive design and efficiency.

While King equipment means outstanding performance, King service means prompt and satisfactory attention to all the needs of the railroad supply departments.

KING PRODUCTS

The following U. S. Metallic Packing Products have enabled railroads to increase the efficiency and lower the cost of locomotive operation:

King steam cylinder cock operating valve. King Sander. King bell ringer. McLain steam operated cylinder cock. King metallic packing for piston rods and valve stems. King mechanical lubricator. King air pump packing. King cylinder packing for reverse gears.

THE U.S. METALLIC PACKING COMPANY

PHILADELPHIA, PENNSYLVANIA

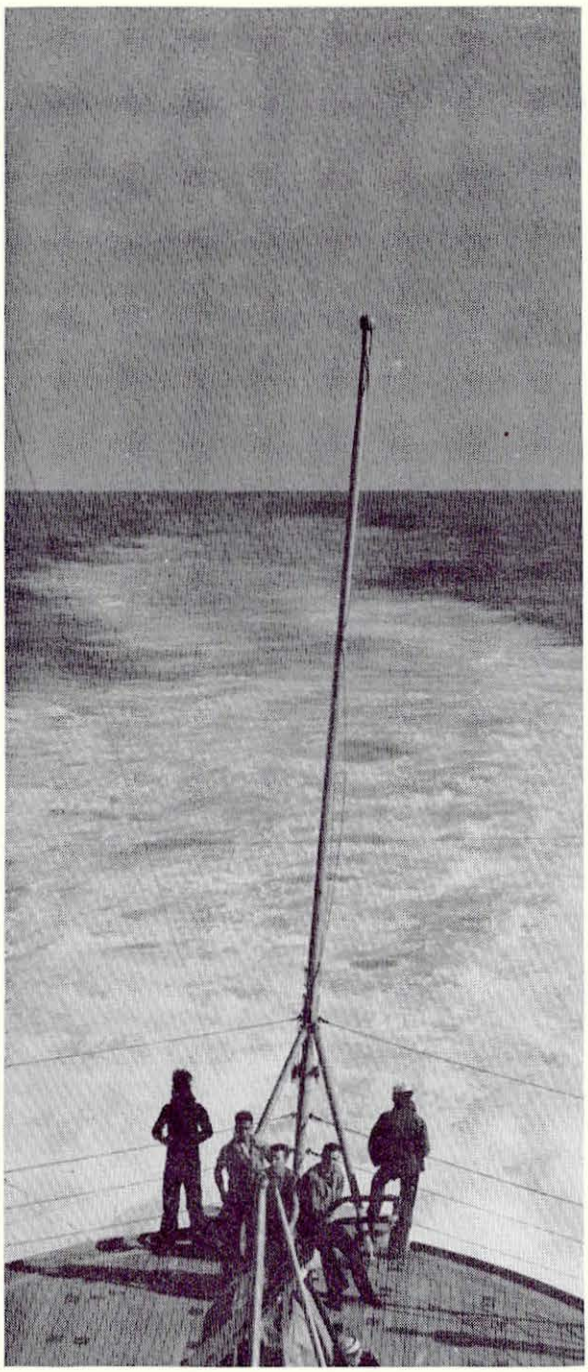
1935

with BENDIX-WESTINGHOUSE genuine Air CONTROL

The ultimate in modern safety, efficiency and economy awaits you in modern, Bendix-Westinghouse Air Control. Backed by over a half century of faithful service in world-wide transportation, genuine Air Control represents a time-tested system well deserving its acceptance as the universal standard. Smooth, sure, with power to spare, Bendix-Westinghouse Air offers today's commercial carrier a flexibility of control unapproached by contemporary equipment plus a wide margin of reserve power for future development. Join the swing to Air in "thirty-five"... realize the difference between ordinary control and positive safety. Write for information on any phase of Genuine Air Control.

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY, PITTSBURGH, PA.

★ GENUINE BENDIX-WESTINGHOUSE CONTROL IS NOW AVAILABLE FOR LIGHTER VEHICLES AT A COST UNPRECEDENTED IN AIR BRAKE HISTORY



Yes, we've left a long, long wake behind!

SURGING always forward . . . always out in front in experimental research or engineering development, we have left a long, long wake behind.

A wake that marks passage through almost all of practical railroad history. A wake that goes back through shoals and heavy seas not just one, not ten, but through 53 years of continuous service to American and Canadian railroads.

In those years we have pioneered insulation and sound deadening in rail transportation. In these years we are pioneering further improvements. The products listed here have been used in by far the greatest percentage of passenger and refrigerator cars built in the last half century.

We look back through last year and all the years to a gratifying business with railroad executives all over the country. We look forward to continued recognition of a job well done.

Hairinsul
Standard refrigerator car insulation.

Dry-Zero
The most efficient and lightest weight low temperature insulation known — standard for low temperature cars.

Salamander
For over 30 years the standard insulation for passenger cars.

Carinsul
Made especially for insulating the letter board of passenger cars.

Ozite Standard Hair Felt
Made by the genuine original platen or felted process and universally recognized as the highest standard of felted insulation.

(Railroad Division)

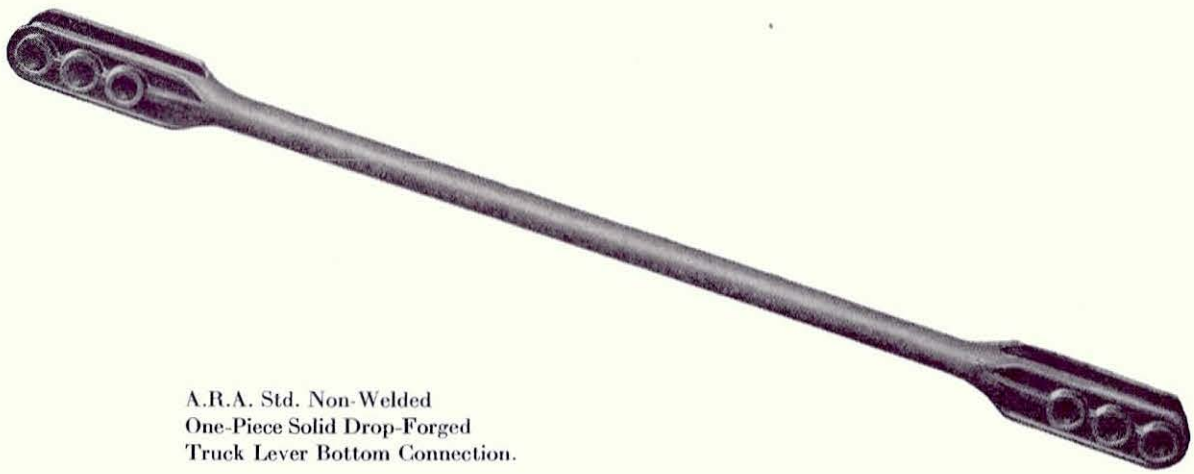
AMERICAN HAIR & FELT COMPANY
DRY-ZERO CORPORATION

Merchandise Mart Chicago

FORGINGS

BY

PITTSBURGH FORGINGS COMPANY



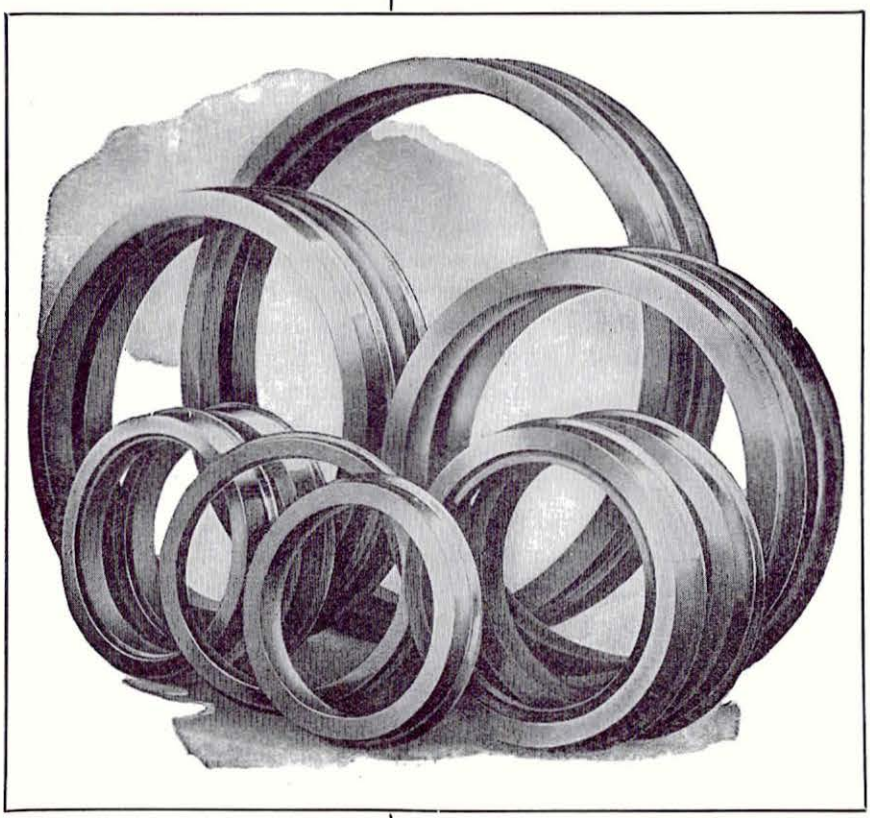
A.R.A. Std. Non-Welded
One-Piece Solid Drop-Forged
Truck Lever Bottom Connection.

For New Cars Or Service

CENTER PLATES
WEDGES
DRAFT YOKES
KEYS
BRAKE LEVERS
BRAKE HANGERS
BRAKE JAWS
BOTTOM CONNECTIONS
FOLLOWER PLATES
GRAB IRONS
WINDING SHAFTS
B. B. SAFETY GUARDS
ETC. — ETC.

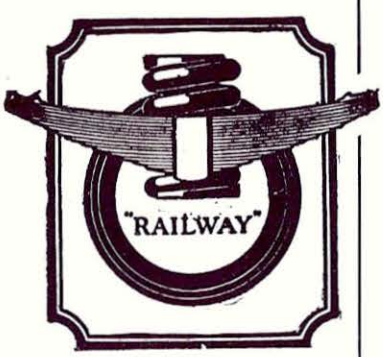
Upon request we will be pleased to furnish your engineers with dimensions of our standardized car forgings, either carried in stock or for which we have dies.

PITTSBURGH FORGINGS COMPANY
MAIN OFFICE: CORAOPOLIS, PA.
PLANTS AT
CORAOPOLIS, PA. JACKSON, MICH.



Tires
Wheels
Springs

For Every Type of Rolling Stock In Every Class of Service



"RAILWAY" locomotive and car wheel tires are made to meet the particular requirement of service. It may be the long continued run of the passenger train or the many stops and starts of the switcher with its constant crowding through switches. For every type of use a tire must be employed that will give the maximum life if there is to be the greatest economy.

Only experience and laboratory research can provide that knowledge. You find it in all "Railway" products.

American Locomotive Company

Railway Steel-Spring Division

30 CHURCH ST., NEW YORK

Branch Offices:

Chicago, Ill. Washington, D. C. Cleveland, Ohio Pittsburgh, Pa. Montreal, Que.
St. Paul, Minn. St. Louis, Mo. Denver, Colo. San Francisco, Cal.

TRADE AUTOMATIC MARK Transportation

It's all in the ★NEW FEATURES

is giving users LOW-COST MATERIAL HANDLING

Model "CEN" Heavy Duty Locomotive Type Crane

Available in capacities from 1,000 to 10,000 pounds at various radii. Rigid or telescopic type booms furnished as required. Remote control of boom, slew and travel simultaneously from driver's platform through individual motors. Slewing table revolves 150° either side of chassis or a total travel of 300°. Large diameter ring gear with heavy shoe guide mounted to crane base prevents sag on off side lifts. Solid selected cast steel base casting with battery or gas-electric unit provides necessary counterweight. Magnetic contactors in travel and lift circuits. Heavy boiler plate protection guard on operator's end. Built-in safety features including stops at high and low boom limits, load radius indicator and controller interlock.

★ Greater speed, highest efficiency, reduced operating costs, in fact entirely new performance records are being established by the modernly redesigned "Automatic" line of trucks. All this is a result of new features made possible by the combined knowledge and ability of expert engineers and the facilities of progressive management. These features follow generally throughout the entire line of redesigned trucks for every industrial requirement giving you maximum accessibility, ease of operation and lowest maintenance costs. In addition to the features described here, other redesigned parts are the Trailing Wheel Mounting, Trailing Axle, Battery Box and Load Platform. These features will give you the most modern truck service ever experienced.

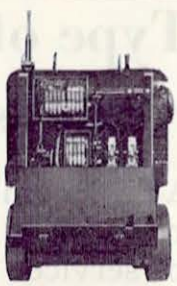
AUTOMATIC TRANSPORTATION COMPANY

DIVISION OF THE YALE & TOWNE MANUFACTURING CO.

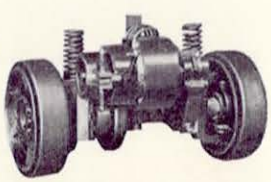
51 WEST 87th STREET CHICAGO, ILLINOIS

★CONTROL SYSTEM

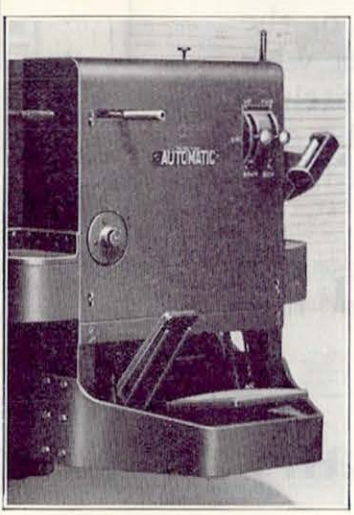
A large hinged cover readily exposes the entire electrical system for inspection. Full magnetic contactor operation provided in traction and lift circuits. New segment mountings on control drums. Special interlock and safety switch features provided. Operating levers indexed for direction.



★DRIVING UNIT



Double reduction spur gear type, insuring highest efficiency. Horizontally split housing. Independent knuckle yokes. Wheels and outer drive yokes Timken bearing equipped. Dual spring mounting. Steering arms bolted directly to drive knuckles. Inspection cover.



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4. *Light in Weight*—Again, as a part of the header with some of its walls common to the header walls, it adds only about 400 lb., as compared with 2½ to 5 times as much added weight for a separate unit.

5. *It is simple*—No bolts, nuts, pins, rings, rods, cotters or anything inside to become loose or lost or broken.

6. *It is accessible*—Any parts that may need attention are readily accessible without entering the smokebox.

7. *Minimum installation expense*—When the header is placed in position and bolted to the dry pipe and steam pipes, the throttle is in place.

8. *Easy to operate*—Small valves are easily balanced and easily lifted.

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Favorable Forecasts of Business

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As Colonel Ayres says, "Recently operations (in the iron and steel industry) have been vigorously expanding, and as a consequence the general sentiment in the industry is optimistic. The prevailing conditions and apparent prospects in iron and steel are of the first significance in our national economy, for this is the most important basic factor in our industrial life since machinery, implements, transportation, and construction are all dependent on it." The railroads are among the largest customers of the iron and steel industry. Their ability to increase their patronage of it awaits an improvement in their earnings, and especially in their net earnings. With a revival of business in the "heavy" industries an increase of railway net earnings would occur rapidly, and the consequent rapid increase in their buying would contribute largely toward accelerating the general improvement.

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Another reason why prospects of the railways are better is that last year they organized the Association of American Railroads for dealing more effectively with both their external and internal problems. Most discussion of railway affairs has related to their relations with government and their competition with other carriers. The industry has, however, internal problems of great importance which it alone can solve. Probably it is true that because it has been so badly treated it has been somewhat too much disposed to complain and somewhat too little disposed to indulge in self-criticism. All individuals, businesses and industries that progress do so largely because they are their own severest critics. They profit not only by external criticism, but even more by introspective criticism. The railroad industry should encourage the officers of the Association of American Railroads not only to answer outside criticisms, but as much as practicable to anticipate them by criticising the internal conduct of the industry itself and trying to improve it. They should have the point of view of the industry as against that of individual lines, and they should express it frankly and courageously. The railway industry itself will have to do most of the work and fighting necessary to restore its earning capacity and maintain private ownership.

Fortunately the prospects of legislation and, especially, Federal legislation, to establish less unequal terms of competition between the railways and other carriers are favorable.

Sensational Improvements in Service

Still another reason why railway prospects are better is that many individual lines recently have done somewhat sensational things that have aroused much public interest and created much favorable public sentiment. These things are mentioned in detail elsewhere in this issue. New passenger train speed records for both long and short distances have been made by both Diesel-powered light-weight trains and by steam-powered trains with steel passenger cars. Unusual popular interest no doubt has attracted many of the passengers with which trains operated on new high speed schedules have been crowded, but undoubtedly many of them have been captured from buses, private automobiles and airplanes. The railways long have been justly criticised for lack of "showmanship." Several have afforded more showmanship within the last year than any other concerns in the country, and it is benefitting them and the entire industry.

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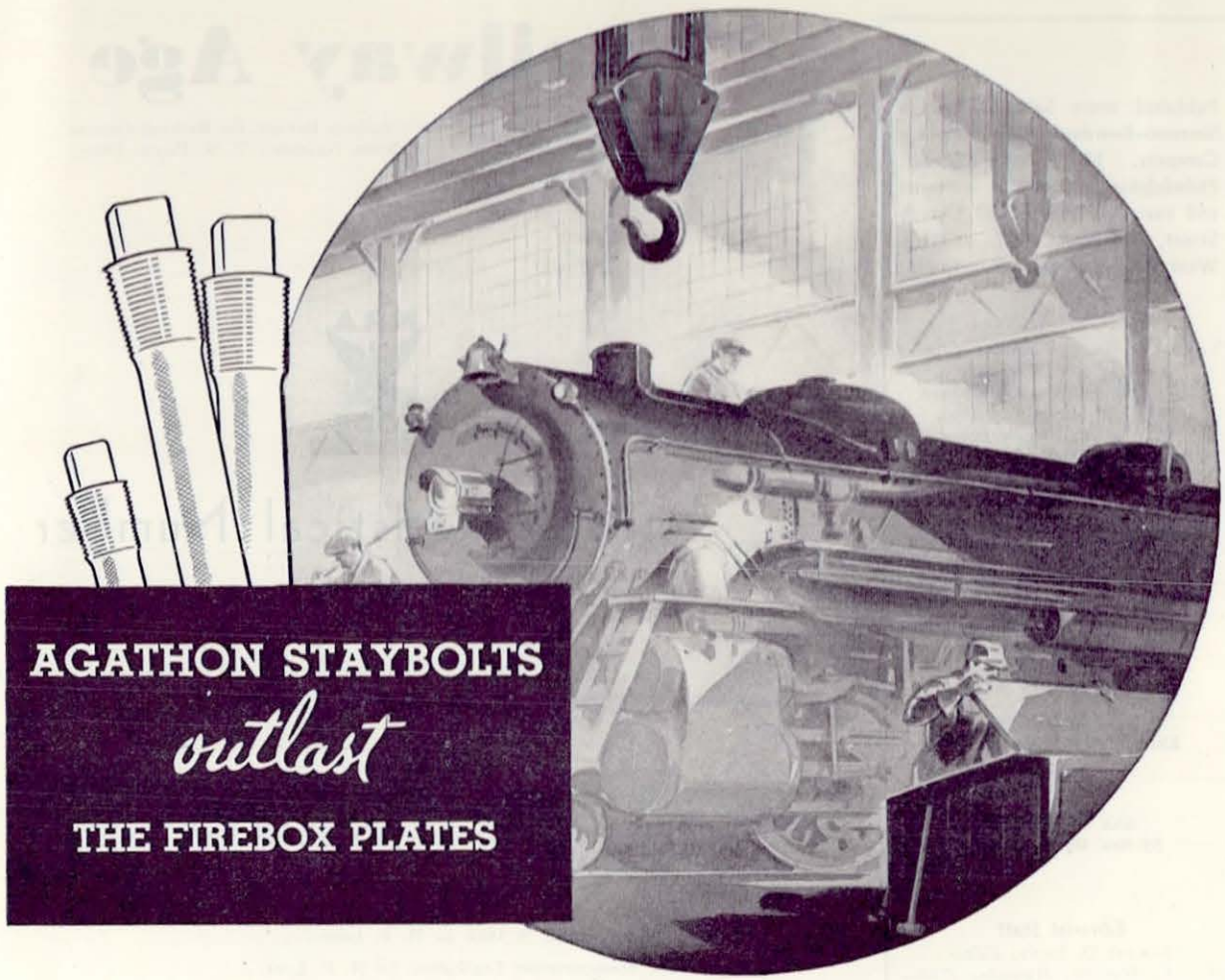

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The Railways in 1934 and 1935

The contents of this Annual Statistical Issue of the *Railway Age* show that the year 1934, like 1932 and 1933, was one of extraordinary fluctuations in the railroad industry and, also, in the affiliated railway equipment and supply manufacturing industry.

In the first half of 1934 both gross earnings and operating expenses were larger than in the first half of 1933, but, owing principally to advances in prices, operating expenses were gaining so rapidly on gross earnings that as early as May net operating income became less than in 1933. In the second half of the year gross earnings became less than in the second half of 1933, while operating expenses continued to be larger, partly owing to the beginning of advances in wages on July 1. The financial outcome was very unsatisfactory. Net operating income for the year was somewhat smaller than in 1933, although substantially larger than in 1932.

Changes in Employment and Buying

These fluctuations in earnings and expenses caused corresponding fluctuations in employment and buying. In June the number of employees was 1,071,000, or almost 100,000 more than in June, 1933. It then began to decline when usually there is a seasonal increase, and in October, when it is normally the largest, it was about 43,000 less than in June; 14,000 less than in October, 1933; and 721,000 less than in October, 1929.

There was a large increase in railway buying, especially in the first half of the year. This was due both to loans of about $200,000,000 from the Public Works Administration and to the increase of net operating income that occurred in the first one-third of the year. The number of locomotives ordered was 183, as compared with only 42 in 1933 and 54 in the years 1932 and 1933 combined. The number of freight cars ordered was 24,611, as compared with only 1,685 in 1933 and 14,533 in the three years 1931, 1932 and 1933 combined. The number of passenger cars ordered was 388, as compared with only 6 in 1933 and 56 in 1931, 1932 and 1933 combined. Comparisons of locomotive and passenger car orders are somewhat difficult because of the purchases of Diesel powered articulated trains which are not included in the figures here given for 1934.

Largest Abandoned Mileage in History

Expenditures for maintenance of both equipment and permanent structures increased, but construction of line continued in a state of almost complete paralysis. The new mileage placed in operation was 76 miles, of which the Dotsero cutoff of the Denver & Rio Grande Western represented 50 per cent. There was almost no construction of second or other additional trackage. The total mileage of line abandoned in 1933 was 1,876 miles, and in 1934 it was 1,995 miles, the largest mileage ever abandoned in any year in the history of the United States. The largest single abandonment was that of the Missouri Pacific between Ft. Scott, Kans., and Lomax, 91 miles. The Chicago & Illinois Valley abandoned its entire mileage of 75 miles. The Duluth, South Shore & Atlantic came third with an abandonment of 74 miles between Superior, Wis., and Marengo Junction.

Seventy-five different railways abandoned 183 different pieces of line in 35 different states. The mileage of railway line in the United States reached its maximum in 1916, when it was 254,251. It has declined since then to less than 244,000 miles. In view of the acceleration of the decline which has occurred within recent years it seems possible the American people may in time achieve their apparent desire to abolish all railway mileage and service.

Purchases of equipment, materials and supplies made by the railways from all manufacturers in 1934 were about twice as great as in either 1932 or 1933, but less than half as great as in pre-depression years.

Traffic Is Improving

The railways have entered 1935 with prospects improved in some respects, but confronted with probably the most difficult problems in their history.

The improvement in their prospects is partly due to the fact that during the last three months there has been occurring the third real and natural improvement in business within the last three years. The others occurred in the last one-third of 1932 and in April-July, 1933. The principal thing that the railways, like all other industries, need is an increase in the volume of their business. This is mainly dependent upon an increase in total production and commerce. The increase of production and commerce now occurring is encouraging because it cannot be attributed to any artificial government measures not in effect before it began. Freight car loadings failed to increase seasonally until in October they were 54.8 per cent of the 1925-1929 average. In November, however, they were 56.2 per cent of this pre-depression average, in De-

cember 59.1 per cent of it, and in the first two weeks of January almost 60 per cent of it, or relatively larger than since last June.

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The more sensational things the railways recently have done inspired the Chicago Tribune, usually a severe critic of them, to publish in its issue of January 11 an editorial entitled "Rebirth of Railway Progress." "An appraisal of the gains that they (the railways) have made during the year 1934," said the Tribune, "will place them near the top of the list of industries that will overcome the depression through their own efforts. . . . We are certain that with the facts before it the fair-mindedness of the American public will thoroughly approve of the progress made and the continuance of the railways under private ownership."

The railways naturally welcome such commendation from any source, but the caption, "Rebirth of Railway Progress," is a misrepresentation because it implies that there had been previously a cessation of progress. Railway gross earnings in 1920 were $6,178,500,000 and in 1929 they were $6,279,500,000. In 1920 operating expenses were $5,827,600,000 and in 1929 they were $4,506,000,000, a reduction of $1,322,000,000, and, because of this reduction of expenses, net operating income increased from only $17,000,000 in 1920 to $1,252,000,000 in 1929. There must have been some progress and efficiency in an industry which made such a record during the years of prosperity. The gross earnings of the railways declined in 1933 to less than $3,100,000,000 and their operating expenses were reduced to less than $2,250,000,000. There must have been some efficiency in an industry which, during the depression prior to 1934, made such a terrific reduction of its operating expenses to offset such a terrific decline of gross earnings, and at the same time continued to render the best and safest transportation service of any kind in the world.

Where Do the Railways Stand Now?

Where do the railways stand now, in spite of having made such records during both prosperity and depression? In the first eleven months of 1934 they earned $423,000,000 net operating income, or about $12,700,000 less than in the corresponding months of 1933, and $780,000,000 less than in 1929. The year 1934 was the third in which they failed to earn their fixed charges. Many are bankrupt, including some that already have passed into trusteeship and others that have been saved from trusteeship only by government loans.

Their present situation is due to several causes. The most important is the depression. Another obvious reason is that their operating expenses are excessive, in spite of drastic retrenchments, because the average hourly wage they are paying is almost 150 per cent higher than before the war and is now being restored to the highest level in history, and because of advances in the prices of materials and supplies due to N.R.A. Another reason for their present situation is the competition of carriers that are subsidized as the railways are not and that are not regulated as the railways are. Meantime they are confronted with demands from the labor unions for six-hour day, train limit, full crew and other legislation which would increase their operating expenses by at least $100,000,000 to $300,000,000 more than the total net operating income that they have earned in any year since 1930.

Fair Treatment—or Government Ownership?

Is an industry which is so important; which has made the record of progress and efficiency since 1920 that statistics we have cited demonstrate; and which, within the last year, under great difficulties, has done the progressive things it has—is such an industry entitled to fair treatment by the press, the public and the Federal and state governments, or is it not? If it is, what would be fair treatment? Would it be fair treatment to continue to subsidize its competitors by air, water and highway? Would it be fair treatment to continue in effect provisions of the Interstate Commerce Act which forbid and penalize unfair discriminations by railways, and forbid them to advance or reduce their rates without the Interstate Commerce Commission's permission, while adopting no similar regulation of competing carriers? Would it be fair treatment to continue in effect regulation of railways requiring them to maintain service once established until government permission is secured to withdraw it, while allowing other carriers to offer and withdraw competitive service at their own free will?

The Chicago Tribune optimistically brushes aside expressions of apprehension regarding the danger of government ownership. There is, however, only one means by which private ownership of railways or any other kind of property can be made worth while and maintained. This is by the making of sufficient earnings in excess of operating expenses and taxes to provide a satisfactory return upon the investment in the property. Policies which divorce ownership from net earnings are essentially communistic, whether advocated by Old Dealers, New Dealers, labor leaders or avowed communists. The objective of communists is the destruction of private ownership of property. They advocate the use of force for this purpose. The objective can be attained as certainly and more easily by policies which destroy the power and opportunity to make net earnings.

An Industry "Between Hell and High Water"

The danger of government ownership of railways and state socialism in this country is not due to their avowed advocacy. It is due to government policies, by whomever advocated, which tend with accelerating force to destroy the earning capacity of railways and other private property. The railways can not be saved from government ownership merely by a desire and disposition on their part, however strong and sensationally manifested recently, to make improvements in their facilities and service. How are they to get the money to make improvements unless they earn it? How are

they going to earn it if they continue to be subjected to present unfair and discriminatory government policies and to be burdened with current increases of their operating expenses and by the enormously greater increase of operating expenses contemplated by the legislative program recently announced by the railway labor unions last week?

The railways are between hell and high water. They are between business men and their spokesmen who favor continuance of the ruinous Old Deal in transportation, and labor leaders who advocate an even more ruinous policy of making an increase in operating expenses which would throw every railway in the country into irretrievable bankruptcy. It is high time that those who speak optimistically about the railroad future, and ostensibly oppose government ownership, should begin to say and do something the effects of which would tend to justify their expressed optimism. The railways of the United States are confronted at this moment with the most acute crisis in their entire history. Those who talk otherwise are either stone-blind or whistling in the dark. They are either grossly ignorant or refuse to face realities and say or do something about them.

What Will Occur in 1935?

What we have just said indicates the problems with which the railways are confronted in 1935. For legislation to help them recover traffic they have lost they and their employees should fight side by side. Unfortunately, the legislative program of the labor union leaders makes difficult the kind of co-operation that is needed between the railways and their employees. Employees all over the country are strongly in favor of Federal and state legislation to equalize terms of competition in transportation, but the leaders of the labor unions pay only lip service to the cause of such legislation while devoting their real efforts and energies to promoting a program the success of which would largely destroy even the present greatly reduced employing and purchasing power of the railways if they remained under private ownership.

The railways have no alternative but to meet the issue presented by the labor union leaders, and fight it out with them. They must oppose the six-hour day, train crew and train limit legislation with every means in their power. They must do more. They must start a movement for a reduction of wages soon after they are restored to the pre-depression level on April 1.

To try to say, in view of all the facts, what railway prospects for 1935 are would be somewhat hazardous. Nevertheless, upon the assumption that the railways and other industries will stand up and fight the unreasonable demands of organized labor, we venture to predict three developments in 1935. There will be an improvement in general business and an increase of railway traffic that will make them both better than since 1931. There will be legislation passed by both Congress and state legislatures to make less unequal the terms of competition between the railways and other carriers. There will be defeat of the six-hour day and other similar legislation demanded both by the railway labor unions and the American Federation of Labor. If all these developments occur, both railway gross and net earnings will be larger in 1935 than in any year since 1931, and perhaps larger than in 1931.

Photo by H. Armstrong Roberts

A Review of Railway Operations in 1934

Improvement in financial results for first half of year followed by discouraging downward trend

By Dr. Julius H. Parmelee
Director, Bureau of Railway Economics

WHEN the historian of transportation comes to set down his record of American railway operation, the entries for 1933, 1934 and 1935 are likely to be outstanding in character: 1933, because forces were set at work to modify the general basis of transport regulation in the United States; 1934, because these forces were approaching a conclusion; 1935, because the results of the two-year activity in the transportation field may be brought to fruition.

By transport regulation we mean both the force of governmental authority applied to coordinate the several agencies of transportation, and the self-regulating powers conferred by the railways on their own new central organization, the Association of American Railroads.

In the field of operation, the year 1933 had shown some improvement in rail revenues and net income. The revenue increase in that year, however, occurred wholly in respect to freight. Traffic and revenues for the year 1934 as a whole increased over 1933, although the tendencies were quite different at different seasons of the year, as will later be indicated. Increases occurred in both freight and passenger revenue in 1934, thus checking the downward tendency in the passenger service that had been so striking an element in the railway picture. Because of increased operating costs, however, net railway operating income was less, and the net deficit after fixed charges, was greater in 1934 than in 1933.

What the operating results will be in 1935, is as yet a closed book, which only the future will gradually disclose. If those forecasters who are predicting a moderate increase in business activity during 1935 prove to be accurate in their predictions, then railway revenues will also show some increase. If the Interstate Commerce Commission approves the increase in freight rates that was under consideration at the close of the year, then the revenues will be by that much enlarged. To what extent these increased sources of revenue, if realized, will be offset by the more comprehensive effect on operating expenses of increased labor and material costs, it is impossible to say. One thing, however, stands out clearly: the railways urgently need an increase in net income in 1935, by whatever means such an improvement may be secured.

In such a year as 1934, crowded with important and colorful events, it is not easy to select the outstanding developments in the railway field. The following summary will be suggestive, each item in the list to be more fully developed later.

1. A marked increase in operating costs.
2. As a result, proposal of the railways to increase certain freight rates and charges.
3. Program of the Federal Coordinator of Transportation, whose term was extended to June 16, 1935.
4. Passage of the Railroad Retirement Act.
5. Passage of the Railway Labor Act.
6. Organization of Association of American Railroads.
7. Improvement in passenger service, strikingly illustrated by air-conditioning, stream-lining, and increased speed.

Railway Finances in General

The gross financial situation of the carriers showed improvement in 1934, in that total operating revenues increased over 1933. But as the increase in revenues was more than absorbed by increased labor and material costs, net income available for fixed charges fell short of meeting those fixed charges by a margin of about 35 million dollars, compared with a deficit of 6 millions in 1933 and of 139 millions in 1932.

Railways continued in 1934 to receive assistance from two governmental sources, in smaller part from the Reconstruction Finance Corporation, and in larger part from the Public Works Administration. The Railroad Credit Corporation continued its liquidation program.

Outstanding loans by the Railroad Credit Corporation, organized by the railways in 1932, aggregated $73,691,000 at the end of May, 1933, when its lending period expired by limitation. Since that date, and continuing through 1934, the Corporation has gradually liquidated its assets, from time to time returning to the railways payments on their original contributions, in the form of cash or of credit on loans. Ten per cent of the total contribution was so returned between June 1 and December 31, 1933, and another 18 per cent during 1934, or 28 per cent in all to the end of 1934. By the end of 1933, outstanding loans had been reduced to $67,344,500, which was further reduced to $54,686,000 at the end of 1934.

Reconstruction Finance Corporation

The Reconstruction Finance Corporation, organized by the government in 1932, authorized 139 loans to railway companies during the years 1932 to 1934, on which $377,000,000 was outstanding in actual loans at the close of 1934. For the whole period of its operations to the end of 1934, transactions of the Corporation with railway companies or their receivers or trustees, may be summarized as follows:

Total loans authorized	$457,856,000
Canceled or withdrawn	5,208,000
Net authorizations	$452,648,000
Disbursed	447,283,000
Repaid	70,728,000
Outstanding, December 31, 1934	$376,555,000

Loans outstanding to railways of Class I amounted to $367,275,000; to smaller companies, $9,280,000.

The net amount of new loans authorized during 1934 was $44,886,000. The net increase in outstanding loans was $64,608,000 in 1933, and $39,475,000 in 1934. The rate of interest charged by the Corporation on loans, which had previously ranged from 5 to 6 per cent per year, was generally reduced to 4 per cent on November 1, 1933.

Public Works Administration

The Public Works Administration, set up under the National Industrial Recovery Act of 1933, allotted a total of $199,607,000 in loans to railways down to December 31, 1934, of which $146,250,000 had actually been disbursed. All but $286,000 of this amount was disbursed to carriers of Class I.

According to the Interstate Commerce Commission's annual report for 1934, certificates of approval issued by it for railway maintenance and equipment work, under the terms of that Act, amounted to $208,046,633.

Receiverships

One railway of Class I, operating 644 miles of line, applied in 1934 for reorganization under the provisions of the revised Bankruptcy Act of 1933. The number of railways of Class I in the hands of receivers, or otherwise undergoing reorganization, totaled 26 on December 31, 1934, with an aggregate operated mileage of 40,339 miles. When railways of Classes II and III are added, the totals become 61 operating companies and 42,395 miles of line.

Increased Costs

Railway operating expenses consist, in largest ratio, of the cost of labor and the cost of materials used or consumed in maintenance or in transportation. In 1930, for example, 60.2 cents of every dollar of operating expenses were paid out by the carriers for labor, while 31.4 cents were paid out for materials and supplies.

When more than 90 per cent of the cost of railway operation begins to rise, the financial shoe pinches, which is the situation that confronted the railways in 1934.

The rise in labor costs began on July 1, 1934, when by agreement between carriers and men the temporary deduction of ten per cent from the standard rates of pay was partially restored. The original deduction, which was effected by mutual agreement, was operative from February 1, 1932, to June 30, 1934. Effective July 1, 1934, the railways restored one-fourth of the deduction, or 2½ per cent. They restored another 2½ per cent on January 1, 1935, while the remaining 5 per cent will be restored on April 1, 1935.

Thus the operating expenses of 1934 were affected by an increased price for labor, to the extent of 2½ per cent of the payroll for the last six months of the year. The amount added to the payroll in that period is estimated at $20,000,000, while the total restoration, on an annual basis, will aggregate $160,000,000 per year.

To the increased labor cost due to rising rates of pay was added the four per cent assessment on payrolls required by the Railroad Retirement Act as the employer's contribution toward the compulsory pension system set up by the act. This act, the provisions and effects of which will be discussed at a later point in this survey, was under review by the courts at the close of the year.

Prices paid by the carriers for coal and other materials increased about 20 per cent from the middle of 1933 to the middle of 1934. The annual increase in operating expenses resulting from these increased prices is calculated at $134,000,000. Because of the gradually rising tendency of the prices in 1934, approximately $100,000,000 of increased cost, due to higher prices, found their way into the operating costs of that year, while the full increase will be reflected in the costs of 1935.

Rates and Fares

Because of increased operating costs, the carriers filed a proposal for increased freight rates in August, docketed by the Interstate Commerce Commission as Ex Parte 115. Hearings were held in various parts of the country, beginning at Washington in October. Railways based their case largely on the increase in prices of materials, on the gradual restoration of wage scales, and on their estimate that the railways in 1934 would fall a considerable amount short of earning their fixed charges. The proposed rate increases applied to selected commodities, were on either a percentage or a weight basis, with specified exceptions, and were estimated to add $170,000,000 to the annual revenues of the carriers.

The proposal was under consideration by the Commission at the end of the year, final argument being heard in January, 1935. The Commission has promised to expedite its decision in the matter.

A nation-wide inquiry into railway passenger fares and the Pullman surcharge was instituted by the Interstate Commerce Commission in 1934. Hearings in the proceeding, which was docketed as No. 26550, opened at Washington on January 16, 1935.

The result of much experimentation by the carriers with passenger fares has been to reduce average receipts per passenger-mile from 3.018 cents in 1923 to less than two cents in 1934. Compared with 1933, there was an average reduction in 1934 of about 5 per cent.

Drought Relief Rates

The great drought of 1934 grew to the proportions of a national calamity. As usual in such emergencies, the railways were called to the rescue, and also as usual promptly responded. Arrangements were made by the Interstate Commerce Commission in cooperation with other government agencies by which Western railways made important concessions in their rates on feed and livestock in the drought area. Rates were reduced on feed to 66.6 per cent, on hay and water to 50 per cent, and on livestock to 85 per cent (with privilege of return movement at 15 per cent), of regular tariff rates.

"Estimates made by western carriers," said the Commission in its annual report for 1934, "indicate that during the year ended October 31, 1934, the emergency reduced rates resulted in a gross concession of approximately $5,823,000 below the charges which would have accrued under regular tariff rates, or under land-grant rates where applicable."

Federal Co-ordinator of Transportation

The office of Federal Co-ordinator of Transportation was created under the Emergency Railroad Transportation Act for one year from June 16, 1933. An extension of one year, to June 16, 1935, was later ordered by the President under the terms of the act.

The Federal Co-ordinator, Joseph B. Eastman, continued in 1934 his extensive research and investigation of many important phases of transportation. He issued numerous general and interim reports covering his findings and suggestions, which have been studied and analyzed by committees of the railways.

Two general reports were issued by Mr. Eastman during 1934. The first report, released in January, discussed the railway situation in general, and discarded

the idea of government ownership and of "grand consolidations" as immediate remedies.

The second report, released in March, recommended (1) a bill for the regulation of motor carriers: (2) a bill for the regulation of water carriers and (3) a bill proposing amendments to the Interstate Commerce Act.

Many reports were also issued by the Federal Co-ordinator during 1934, dealing with various phases of rail transportation and operation. Only brief references to the more important of these reports can here be made. None of them have become final, in the sense that their findings have either been accepted and made effective by the railways, or that they have led to formal orders by the Federal Co-ordinator. All of them, however, are undergoing careful study by railway managements.

The merchandise traffic report proposes a consolidation and coordination of the handling of merchandise freight. The passenger traffic report will doubtless recommend improvements in the passenger service, modernized methods of merchandising, standardized fares for coach, reserved-car, and de luxe service, and general progress in the comfort and convenience of passenger travel by rail. A formal report on car pooling proposes a pooling of box cars, as a beginning of general pooling of all freight cars in the future. Railway purchasing of materials and supplies, with standardization, simplification, and research, has been the subject of another report. Another activity deals with problems of cost finding. A series of studies deal with competing forms of transportation. Labor relations form another important phase of the Federal Co-ordinator's work, as evidenced by his special studies of a selected group of employees in 1934 and his appearance before Congressional committees with reference to the Railroad Retirement Act. In general, the Co-ordinator's staff has occupied itself with the problem of improved efficiency and greater economy through standardized methods.

In conducting the studies and preparing the reports outlined above, the Federal Co-ordinator has sent out many questionnaires to railway companies, to other transportation agencies, to shippers, and to the traveling public. Much of his factual information was developed from these questionnaires. Throughout his period of office, the Co-ordinator has had the co-operation of the carriers in developing statistics and other information, as well as in the study of particular problems.

President Roosevelt, in his first message to the Seventy-fourth Congress, forecast a program of transportation legislation to be later transmitted to Congress for its consideration. It is hoped that the Federal Co-ordinator's comprehensive program of research, carried on throughout the whole of 1934, will bear fruit in the form of constructive legislation during the year 1935.

Railroad Retirement Act

Many bills dealing with railroad labor were introduced in the Seventy-third Congress, and were referred to the interstate commerce committees of the two Houses for consideration and report. Among these were the following important items, only one of which—the retirement bill—became law. The list does not include the Railway Labor Act, which is described later.

1. Six-hour-day bill—designed to reduce the working day of railroad employees from eight to six hours.
2. Train-limit bill—designed to limit the length of freight trains to one-half mile and the length of passenger trains to 14 cars.
3. Full-crew bill—designed to fix the number of trainmen legally required to operate trains of various lengths.
4. Twelve-hour maximum day bill—designed to reduce the maximum permissible working hours from 16 to 12 in any one day.
5. Flagging bill—designed to fix the number of men engaged in flagging protection for maintenance of way crews.
6. Signal bureau bill—designed to require installation of block signal systems, interlocking devices, highway grade crossing protective devices, automatic train stop, train control, cab signals and other devices.
7. Unemployment insurance bill—designed to provide a system of insurance for railway employees during periods of unemployment.
8. Retirement bill—designed to establish a pension system for superannuated employees.

The cost to the railways of these proposed bills, if enacted, was estimated by them at approximately $1,640,000,000 per year, calculated on the basis of 1930 operations, and about a billion dollars when calculated on the basis of 1933 operations.

The Railroad Retirement Act, approved June 27, 1934, was intended (to use the words of the Interstate Commerce Commission) "to provide adequately for the satisfactory retirement of aged employees, to promote efficiency and safety in interstate transportation, and to make possible greater employment opportunity and more rapid advancement of employees in the service of the carriers."

The bill was rushed through the Seventy-third Congress in the closing days of its final session, with the result that no adequate hearings were held on the bill, and many of its provisions were loosely worded. President Roosevelt, in a candid statement issued by him when he signed the measure, said it was "crudely drawn" and would need amendment. Nevertheless, he approved it, appointed the Railroad Retirement Board of three members, and they took office on August 1, the effective date of the act.

The carriers attacked the constitutionality of the act and in October the Chief Justice of the Supreme Court of the District of Columbia found the act invalid, and enjoined the Board from carrying out its provisions. Final decision now rests with the Supreme Court of the United States, to which appeal has been taken, and which will take it up for consideration at an early date.

Because of its uncertain future legal status, it is unnecessary to deal with the act in detail here. Briefly, it sets up a retirement system for rail employees, the cost of which is borne one-third by employees and two-thirds by employers. Men may retire either at the age of 65, or after 30 years of service, and their annuity is proportioned to their length of service up to 30 years, and their rate of pay, with a maximum annuity of $120 per month. Annuities were to begin on February 1, 1935, but none will be granted or paid until and unless the act is held valid by the Supreme Court.

The act fixed the rate of assessment on employers and employees at 4 and 2 per cent of the payrolls, respectively. The Retirement Board's own computations show that the retirement fund would be bankrupt after the seventh or eighth year, on these assessment rates, and that it would be necessary to increase the rates to much higher levels in the future.

At the rates mentioned, however, the annual cost to the railways was computed by them at $60,000,000, of which about $17,500,000 was actually added to their operating expenses in 1934.

Railway Labor Act

This act was approved June 21, 1934. In the words of the Interstate Commerce Commission: "The new act abolishes the Board of Mediation created by the earlier

Act, and in its stead provides for a National Railroad Adjustment Board and a National Mediation Board. The purpose of the Act is stated in its title to be 'to provide for the prompt disposition of disputes between carriers and their employees.' "

The act establishes the principle that the majority of any class of railway employees shall have the right to determine who shall be the representatives of that particular class. Further, by providing that the selection of members to the board of adjustment shall be by national organizations, it deprives any minority group within a particular class of employees of representation on such boards.

The act applies particularly to the adjustment of disputes arising out of the interpretation or application of agreements concerning rates of pay, rules, or working conditions. Where such disputes cannot be adjusted locally, one of four divisions of the National Railroad Adjustment Board, which consists of 18 members selected by the carriers and 18 members selected by national labor organizations, considers the matter and makes an award.

The act abolished the old Board of Mediation, which consisted of five members, and created a new National Mediation Board, of three members. The new Board will have much the same duties as the old one, handling matters involving changes of pay, rules or working conditions not referable to an Adjustment Board.

Association of American Railroads

During the fall of 1934 a comprehensive reorganization and consolidation of the Association of Railway Executives, American Railway Association and other railway organizations was effected by the carriers, "in order to promote trade and commerce in the public interest, further improve railroad service and maintain the integrity and credit of the industry."

The new Association, recognizing the status of the railroads as charged with the responsibility of furnishing adequate, efficient and economical transportation services at all times, represents the co-ordinated efforts of the industry to meet that obligation. Further recognizing the need for united attack upon the problems before the industry at the present time, the Association has provided a means whereby all member roads will uphold in principle and in action the stated policies of the industry. From these co-ordinated efforts, it is hoped to develop more efficient and economical transportation services to the public.

Among other things, the Association has set up a definite means of settling disagreements between companies, either by reference to the Board of Directors, or by reference to special arbitration.

The Association has an active Board of Directors, and a continuing Executive Committee of the Board.

Improvements in Passenger Service

Three principal developments during 1934 in the field of railway passenger service have already had, and will continue to have, a stimulating effect on the traffic. These were streamlined trains, air conditioning, and increased speed.

Several companies tested a new type of streamlined trains during the year, powered by Diesel-electric motors and of sturdy but light-weight construction. One of these trains broke all speed records on a spectacular trial run from California to New York, while another was in actual scheduled service in the middle west by the close of the year. Several companies have similar trains on order, which will be placed in regular service in 1935. These trains have the double advantage of high speed and comfortable travel, together with comparatively low costs of construction, maintenance, and operation.

Air-conditioning of passenger cars has proceeded rapidly. While definite figures are not available, it appears that close to 3,000 cars had been air-conditioned by the end of 1934, and that this number will be materially increased in 1935.

Increased speed of passenger service has been stimulated by the appearance of streamlined trains, capable of making 100 miles or more per hour. Running time on many of the regular steam-train runs was reduced in 1934, and the prospect is for further reductions during 1935.

Transport Competition and Regulation

Sentiment regarding the unregulated and indirectly or partially subsidized forms of transportation which are in competition with the strictly regulated and heavily taxed railroads seemed to be gathering momentum during 1934. More and more authorities, both Federal and State, reached the conclusion that only regulation equally imposed on all can possibly extract the whole transport industry from chaos and confusion.

As a result of this gradual change in sentiment, it is hoped that during the present session of Congress concrete action may be taken looking to the improvement of the situation by appropriate legislation.

At the same time, the movement to make new expenditures on rivers and waterways seems to have fired the imagination of many government officials. Unfortunately, at this time of great unemployment, the improvement of rivers offers a tempting chance to put men to work, with the result that economic considerations are likely to receive scant attention.

The Secretary of War submitted to Congress in June a preliminary report on a comprehensive plan for improvement and development of the rivers of the United States. The following passage appears in the report: "As a result of the War Department's investigations now nearing completion, about 2,000 river projects have been found practicable, with an estimated aggregate cost of about $8,000,000,000. The relation between estimated costs and estimated benefits of these projects has been determined. Obviously, more projects have been investigated than could be undertaken and paid for in the measurable future, but the expenditure of $8,000,000,000 over a 50-year period would involve an average annual outlay of but $200,000,000." When such a considerable sum as $200,000,000 annually is qualified with the "but" of the report, it seems unlikely that much limitation will be put on expenditures of this type. This is in spite of the fact that many such expenditures will admittedly produce little traffic, when compared to the enormous capital outlays involved.

The project for improving the Missouri river is a case in point. The report of the Mississippi Valley Committee of the Public Works Administration, in their report of October 1, 1934, says: "Thus, the total construction cost for the improvements under way will not be much, if any, below $250,000,000." And again, "most current estimates of prospective tonnage are exceedingly liberal, and if the present traffic on the section below Kansas City may be accepted as in any degree indicative of future prospects, the probability of these estimates (of savings to shippers) ever being realized even on a free waterway is very slight."

With refreshing frankness, the same committee report, while admitting that transportation facilities are frequently retained in service "long after their profitableness from a strictly accounting standpoint has disap-

peared," predicates its waterway policy on the following basis of logic—an expedient basis at best:

"If we had never gone in for inland waterways, our problem would be different. But we are in it, and in it deep, and probably to stay, if only for the reason that development or regulation of a given river may be desirable from one or more standpoints other than navigation . . . So our task is to take the situation as it is—not as any one of us would construct it anew—and plot a reasonably logical future with the present as its base."

Federal appropriations and allotments for highway construction have also been enlarged in recent years, stimulated by the demand for unemployment relief. The authorizations for the fiscal years 1929 and 1930 were $75,000,000 per year. For the years 1931 to 1935, the annual average increased to $235,000,000, distributed by years as follows:

1931	$205,000,000
1932	125,000,000
1933	245,000,000
1934	400,000,000
1935	200,000,000
Total	$1,175,000,000

Efforts were under way, toward the close of 1934, to have a considerable proportion of Federal highway funds allocated to the work of eliminating railway grade crossings, which would be of material benefit to both rail and highway traffic.

The general legislative policy of the railways, as regards the feature of competition, embraces the regulation of interstate motor carriers by highway, a more comprehensive regulation of carriers by water, and repeal of the Fourth Section, or long-and-short-haul clause, of the Interstate Commerce Act.

Principal Operating Factors

The following summary of the statistical results of railway operation in 1934 will be succeeded by a somewhat more detailed analysis. All the statistics relate to railways of Class I, and some of them at this writing are partially estimated, and subject to later revision.

1. Freight traffic (ton-miles) in 1934 increased 7.5 per cent over 1933, and 14.5 per cent over 1932.

2. Passenger traffic (passenger-miles) increased 8.9 per cent over 1933, and 4.9 per cent over 1932.

3. Operating revenues increased 5.0 per cent over 1933, while operating expenses increased 8.5 per cent. The operating ratio rose from 72.7 per cent in 1933 to 75.0 per cent in 1934.

4. Net railway operating income aggregated $450,000,000 in 1934, a decrease of $24,000,000 under 1933.

5. The net deficit after fixed charges amounted to $35,000 000 in 1934, compared with net deficits of $6,000,000 in 1933, and $139,000,000 in 1932.

Traffic

The unbroken decline in railway freight traffic, measured in revenue carloadings, which had extended from October, 1929, to May, 1933, was checked in the second week of that month. The improvement was maintained, week by week, to the close of the year 1933. This weekly improvement continued for exactly one-half of 1934. By June 30 the accumulated gain for the six-month period was 2,067,000 cars, over the corresponding period of 1933, an increase of 15.4 per cent. At this point the improvement ceased abruptly. The second half of the year, with the exception of one week in November and three in December, showed lower traffic totals than in 1933, so that the year closed with a gain of 1,566,000 cars, or 5.4 per cent. Whether the moderate upturn in December was more than temporary, it remains for 1935 to prove.

Table I summarizes railway freight and passenger traffic in the years 1930 to 1934, compared with the five-year average, 1926 to 1930, in each case.

Table I—Comparative Traffic Statistics

Revenue Carloadings	
1934	30,786,000
1933	29,220,000
1932	28,180,000
1931	37,151,000
1930	45,717,000
Five-year average, 1926-1930	50,974,000
Revenue Ton-miles	
1934	268,000,000,000
1933	249,223,000,000
1932	233,977,000,000
1931	309,225,000,000
1930	383,450,000,000
Five-year average, 1926-1930	427,234,000,000
Revenue Passenger-miles	
1934	17,800,000,000
1933	16,341,000,000
1932	16,971,000,000
1931	21,894,000,000
1930	26,815,000,000
Five-year average, 1926-1930	31,723,000,000

Carloadings in 1934 increased 5.4 per cent over 1933, but were 39.6 per cent below the five-year average. Revenue ton-miles increased 7.5 per cent over 1933, but

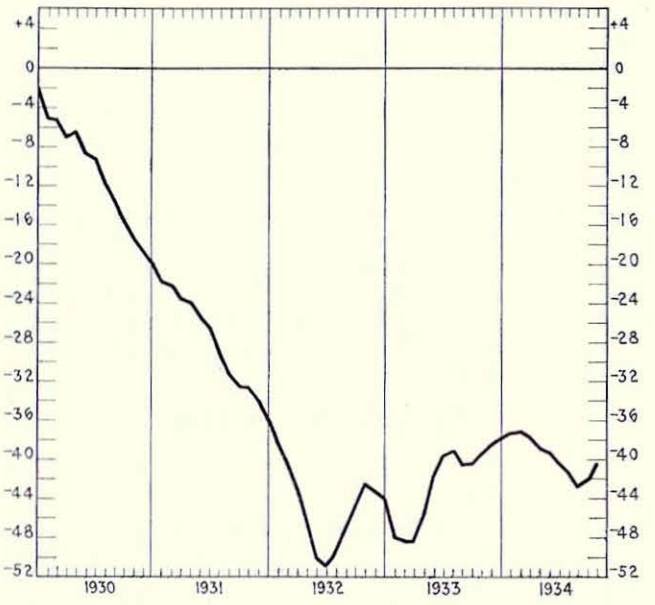


Chart A—Comparative Trend in Car Loadings During the Years 1930-1934, Inclusive

Moving averages of car loadings, being per cent of increase or decrease over the corresponding period of five-year average, 1926-1930. It is based on middle of month of successive three-month periods.

fell 37.3 per cent below the five-year average. Passenger-miles in 1934 were 8.9 per cent above 1933, and 43.9 per cent below the five-year average.

This increase in passenger traffic, accompanied by a somewhat smaller increase of 3.3 per cent in passenger revenue, was one of the outstanding features of the year 1934. It marked the first time since 1923 that passenger traffic trends had not been steadily and discouragingly downward.

Freight Traffic

Freight loadings in 1934 aggregated 30,785,594 cars. The peak was reached in the week ending September 15, when 645,986 cars were loaded. Although the aggregate carloadings in 1934 were greater than in 1933, the peak loading was greater in 1933 by more than 27,000 cars. Revenue ton-miles amounted to 268 billion ton-miles. Ton-miles increased 7.5 per cent over 1933 in the Eastern District, 6.0 per cent in the Southern Region, and 10.5 per cent in the Western District.

Chart A outlines the comparative trend in carloadings

during the years 1930 to 1934, the percentages being the decrease of each successive three-month period under the corresponding average period of the five years from 1926 to 1930.

The curve on the chart ran generally downward from the beginning of 1930 to July, 1932, when it was 50.9 per cent below the five-year average. The curve turned upward in August, declined through the first quarter of 1933, then followed another generally upward movement, culminating in March, 1934. There followed a gradual downward trend to September, with a slight upturn toward the close of the year 1934.

Loadings by Commodity Groups

Table II distributes the carloadings of 1934 among the eight principal commodity groups. The second column gives the percentage increase or decrease of each group from 1933 to 1934.

Table II—Distribution of Carloadings

	Number (000)	Per cent Increase 1934 over 1933	Per cent Distribution 1934	1933
Grain and products	1,642	*d* 1.1	5.3	5.7
Live stock	1,074	21.1	3.5	3.0
Coal	6,084	6.8	19.8	19.5
Coke	335	12.4	1.1	1.0
Forest products	1,147	4.2	3.7	3.8
Ore	795	7.0	2.6	2.5
Merchandise, L.C.L.	8,244	*d* 2.4	26.8	28.9
Miscellaneous	11,465	10.3	37.2	35.6
Total	30,786	5.4	100.0	100.0

d Decrease.

Six of the eight commodity groups increased in 1934, the percentage of increase ranging from 21.1 per cent for live stock down to 4.2 per cent for forest products. Grain and merchandise L.C.L. both showed declines. Coal, coke and miscellaneous accounted for 1,510,757 cars out of the net increase of 1,565,542 cars in 1933, or 96.5 per cent.

Financial Results in 1934

Table III summarizes the operating income account for the years 1934, 1933 and 1930.

Table III—Income Account

	1934 (millions)	1933 (millions)	1930 (millions)
Total operating revenues	$3,250	$3,095	$5,281
Total operating expenses	2,440	2,249	3,931
Taxes	240	250	349
Net railway operating income	450	474	869
Operating ratio	75.0%	72.7%	74.4%

Total operating revenues amounted to $3,250,000,000 in 1934. The increase over 1933 was $155,000,000, or 5.0 per cent, while the decline under 1930 was 38.5 per cent. Operating expenses in 1934 totaled $2,440,000,000. This was an increase of $191,000,000, or 8.5 per cent, over 1933. The reduction under 1930 was 37.9 per cent.

Net railway operating income amounted to $450,000,000 in 1934. This was a decrease of 5.1 per cent under 1933, and was less by 48.2 per cent than in 1930.

As in 1932 and 1933, the railways in 1934 experienced a net deficit after fixed charges. The amount of the deficit in 1934 was $35,000,000, compared with a net deficit of $5,863,000 in 1933, and a net deficit of $139,204,000 in 1932.

As already indicated, traffic and financial conditions were much better during the first than during the second half of the year 1934. This is depicted by Chart B, which shows (in dollars) the increase or decrease in net income during each month of 1933 and 1934 (through November). The comparison in each case is with the corresponding month of the next preceding year.

The chart shows 1934 to have been divided into almost equal parts by a differing tendency. During the first half of the year, net income was greater than in 1933, culminating in March. By contrast, the later months of the year were all below the levels of 1933.

Operating Revenues

Table IV compares the principal items of railway revenue in 1934, with 1933 and 1930.

Table IV—Operating Revenues

	1934 (millions)	1933 (millions)	1930 (millions)
Freight revenue	$2,620	$2,493	$4,083
Passenger revenue	340	329	730
Mail revenue	91	92	111
Express revenue	53	45	115
All other	146	136	242
Total	$3,250	$3,095	$5,281

Freight revenue increased $127,000,000 from 1933 to 1934, or 5.1 per cent. Passenger revenue increased by $11,000,000, or 3.3 per cent. Mail revenue fell off 1.1 per cent, but express revenue increased 17.8 per cent.

Operating Expenses

Table V compares operating expenses of 1934, by principal accounts, with 1933 and 1930.

Table V—Operating Expenses

	1934 (millions)	1933 (millions)	1930 (millions)
Maintenance of way	$363	$322	$706
Maintenance of equipment	640	599	1,019
Traffic	91	86	128
Transportation	1,160	1,078	1,848
General and other	186	164	230
Total	$2,440	$2,249	$3,931

The largest single account, transportation expenses, increased $82,000,000 over 1933, or 7.6 per cent. Maintenance expenses in 1934—way and equipment combined—increased $82,000,000, or 8.9 per cent.

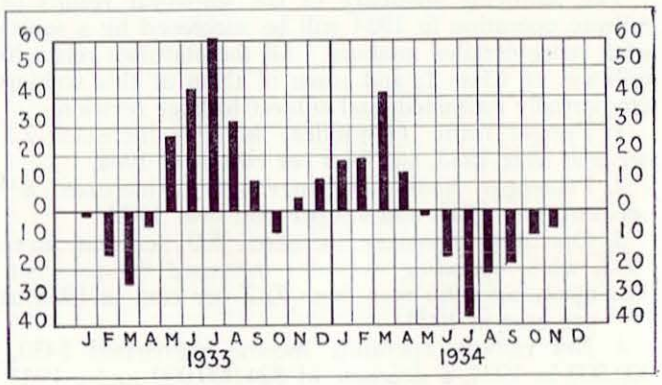


Chart B—Increase or Decrease of Net Income During Each Month of 1933 and 1934

Net income or deficit, after fixed charges, in millions of dollars; each month is compared with the corresponding month of the preceding year.

Net Railway Operating Income and Rate of Return

Table VI compares the amount of net railway operating income and the rate of return on property investment, year by year, from 1926 to 1934.

Table VI—Net Railway Operating Income and Rate of Return

	Net Ry. Op. Inc. (000)	Per cent		Net Ry. Op. Inc. (000)	Per cent
1934	$450,000	1.73	1929	$1,251,698	4.84
1933	474,296	1.83	1928	1,172,864	4.65
1932	326,298	1.25	1927	1,067,985	4.30
1931	525,628	2.00	1926	1,213,090	4.99
1930	868,879	3.30			

The rate of return in 1934 was 1.73 per cent, compared with 1.83 per cent in 1933. Corresponding rates of return for the three districts in 1934 were as follows:

Eastern District, 2.1 per cent; Southern Region, 1.6 per cent; Western District, 1.2 per cent.

Revenue per Traffic Unit

Freight revenue per ton-mile, and passenger revenue per passenger-mile, have declined almost steadily since 1921. The decline for the thirteen-year period from 1921 to 1934 was 23.5 per cent in average revenue per ton-mile, and 38.1 per cent in average revenue per passenger-mile.

Table VII gives the complete record for the years 1921 to 1934, inclusive, and shows a considerable decrease in average revenue per ton-mile and per passenger-mile, during even the one year 1934.

Table VII—Average Revenue per Ton-Mile and Passenger Mile, 1921-1934

Year	Revenue per Ton-mile (cents)	Revenue per Passenger-mile (cents)
1934	0.975	1.910
1933	0.999	2.013
1932	1.046	2.219
1931	1.051	2.513
1930	1.063	2.717
1929	1.076	2.808
1928	1.081	2.850
1927	1.080	2.896
1926	1.081	2.936
1925	1.097	2.938
1924	1.116	2.978
1923	1.116	3.018
1922	1.177	3.027
1921	1.275	3.086

Capital Expenditures and Purchases

Table VIII summarizes the gross capital expenditures and railway purchases of materials and supplies, for each year from 1925 to 1934.

Gross capital expenditures for 1934 aggregated $200,000,000, while purchases of material and supplies totaled $525,000,000.

Table VIII—Capital Expenditures and Purchases

Year	Capital Expenditures	Purchases of Material and Supplies
1934	$200,000,000	$525,000,000
1933	103,947,000	465,850,000
1932	167,194,000	445,000,000
1931	361,912,000	695,000,000
1930	872,608,000	1,038,500,000
1929	853,721,000	1,329,535,000
1928	676,665,000	1,271,341,000
1927	771,552,000	1,395,928,000
1926	885,086,000	1,559,032,000
1925	748,191,000	1,392,043,000
Total, ten years	$5,640,876,000	$10,117,229,000

Railway Equipment

According to reports of the Car Service Division, Association of American Railroads, 59 steam and 31 electric locomotives were installed in 1934, and 23,812 freight cars were installed. On December 31 there were on order 7 steam and 90 electric locomotives, and 628 freight cars. The number of units on order at the close of the year were much below normal, although greater than in 1933. This is indicated in Table IX.

Table IX—Equipment Installation

	Installed During Year	On Order December 31
Locomotives:		
1934	90	97
1933	1	1
1932	37	3
1931	124	39
1930	782	120
Freight cars:		
1934	23,812	628
1933	1,879	224
1932	2,968	2,431
1931	12,662	4,042
1930	76,909	9,821
Passenger cars:		
1934 (9 months)	164	193
1933	147	6
1932	205	15
1931	528	15
1930	1,702	264

Stored serviceable locomotives averaged 5,056 in 1934, as against 7,408 in 1933 and 10,659 locomotives in 1932.

The daily freight car surplus averaged 362,585 serviceable cars in 1934, compared with 515,451 in 1933 and 694,147 for the year 1932. These figures do not include privately owned or special service cars.

Locomotives in good order averaged 73.9 per cent in 1932, 78.9 per cent during 1933, and 77.4 per cent in 1934. Serviceable freight cars averaged 89.4 per cent in 1932, 85.8 per cent during 1933, and 84.9 per cent in 1934.

Freight Train and Car Movement

The average speed of freight trains between terminals has increased progressively since 1923. This average reached a new high record in 1934, as indicated in Table X. The increase from 1924 to 1934 was 38.3 per cent.

Table X—Average Speed of Freight Trains

	(Miles per Hour)
1934 (11 mos.)	15.9
1933	15.7
1932	15.5
1931	14.8
1930	13.8
1929	13.2
1928	12.9
1927	12.3
1926	11.9
1925	11.8
1924	11.5

Average movement per "active" (i.e., total less surplus) freight car per day during the first eleven months of 1934 was 29.0 miles, compared with 27.7 miles for the first 11 months of 1933. This was an average of 381.6 miles per day of 24 hours' continuous movement.

Average movement per "active" (i.e., total less stored) freight locomotive was 57.4 miles per day during the first 11 months of 1934, compared with 54.1 miles for the first 11 months of 1933. The corresponding average for "active" passenger locomotives was 111.5 miles per day during the first 11 months of 1934, and 107.0 miles for the first 11 months of 1933. Both of these factors showed improvement in 1934.

Other Performance Averages

Both the average freight train load and car load increased in 1934. The average train load was 708 tons during the first eleven months of 1934, compared with 701 tons during the first eleven months of 1933. The average car load, or ton-miles per loaded freight car-mile, for the first eleven months of 1934 was 25.6 tons, compared with 25.6 tons during the same period of 1933.

Net ton-miles per freight car per day in 1934 also increased. The daily average was 380 ton-miles for the first eleven months of 1934, compared with 333 ton-miles in the same period of 1933.

Gross and net ton-miles per train-hour during 1934, compared with the years 1933 and 1932, were as follows:

	Gross	Net
1934 (11 mos.)	28,129	11,249
1933	27,343	10,974
1932	26,046	10,265

Both of these factors broke all previous records in 1934.

Fuel consumption per 1,000 gross ton-miles in the freight service during the first 11 months of 1934 was 120 pounds compared with 120 pounds in the first 11 months of 1933, 123 pounds in 1932, and 163 pounds in 1922. Fuel consumption per passenger train car mile during the first 11 months of 1934 averaged 15.1 pounds, compared with 15.1 pounds for the first eleven months of 1933, 14.9 pounds in 1932, and 17.9 pounds in 1922.

Total number of casualties to nontrespassers resulting from railway operation in 1934 (9 months) showed an

(*Continued on page 134*)

Speed an Outstanding Development in 1934

Railways make record runs—Public comfort and convenience reach new levels—Passenger traffic gains for first time since 1923

By Raymond A. Doster and Charles Layng

Associate Editors, Railway Age

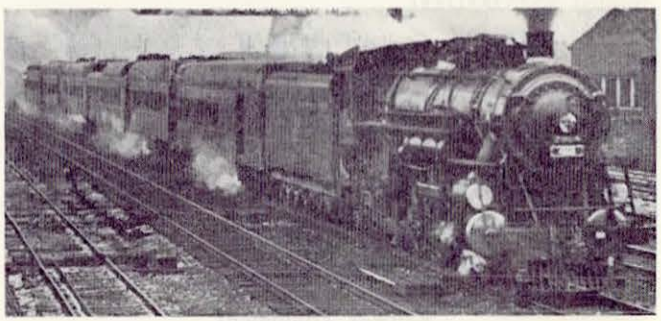
SPEED and still more speed was the railways' slogan in 1934. With the crashing of all existing speed records, the public's attention and interest were attracted to the railways during the year as they have not been for decades. Two factors entered into this development; competition between the railways and other transport[illegible] and competition between two forms of power—steam and Diesel. It is much too early to proclaim the victor, but certainly the practical revolution of rail transportation that had its beginnings in 1934 will hold the interest of railroaders, and laymen as well, for some time to come.

Record-Breaking Runs

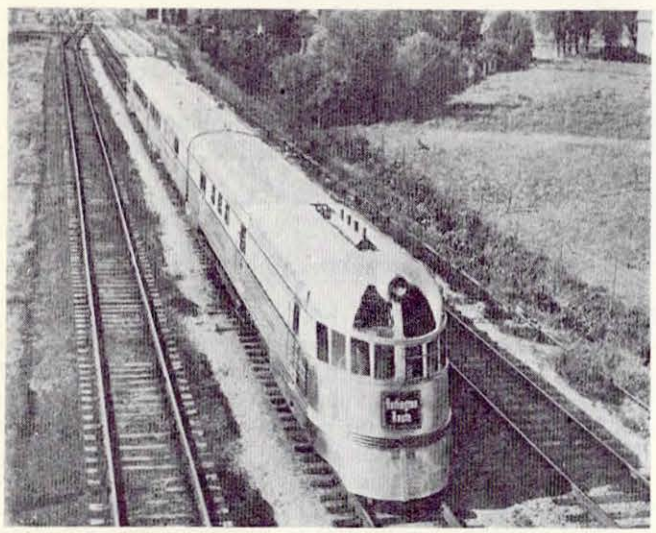
At the break of a mountain dawn in Denver, Colo., on May 26, a checkered flag flashed, a gleaming new train of revolutionary design broke the clocker's tape—and the speed contest was on. That same evening, this train, after passing between almost continuous walls of spectators from the Rocky Mountains to Lake Michigan, made its triumphal entry into the Century of Progress Exposition in Chicago. The new Diesel-powered streamlined Zephyr of the Chicago, Burlington & Quincy has established a mark to shoot at. Leaving Denver at 5:05 a.m. (mountain time), it made a non-stop run of 1,015.4 miles to Halsted street, Chicago, in 13 hr. 5 min., or at an average speed of 77.5 miles per hour for the entire distance. The maximum speed attained was 112.5 miles per hour and 19.1 miles of the distance were traveled at more than 100 miles per hour.

Less than two months later, on July 20, steam took the center of the stage when the regular 9 a.m. Milwaukee Express of the Chicago, Milwaukee, St. Paul & Pacific smashed the world's record for sustained steam train speed by traveling the 85 miles from Chicago to Milwaukee, Wis., in 67 min. 35 sec., or at an average speed of 75.5 miles per hour. The train traveled at a maximum speed of 103 miles per hour between Oakwood and Lake, a distance of 9 miles, at [illegible] hour for the 31 miles between Russell and Lake; and at 91.1 miles per hour for the 69.9 miles from Mayfair to Lake.

Ten days later, to demonstrate the feasibility of a 6½-hr. schedule for Diesel-powered streamlined trains which the Chicago, Burlington & Quincy will place in service between Chicago and the Twin Cities in the spring, that railroad operated its Zephyr from Chicago to St. Paul, 431 miles, in 6 hr. 4 min., including 6 stops of 1-min. standing time each, or at an average of 71 miles per hour for the entire distance, and on the following day made the return trip in 6 hr. 9 min.



The Schedule of the North Western's "400," 408½ Miles in 420 Min., Is the Fastest in the World



The Burlington's Zephyr Established a Record for Speed Over Distances Greater Than 1,000 Miles—1,015 Miles in 13 Hr. 5 Min.

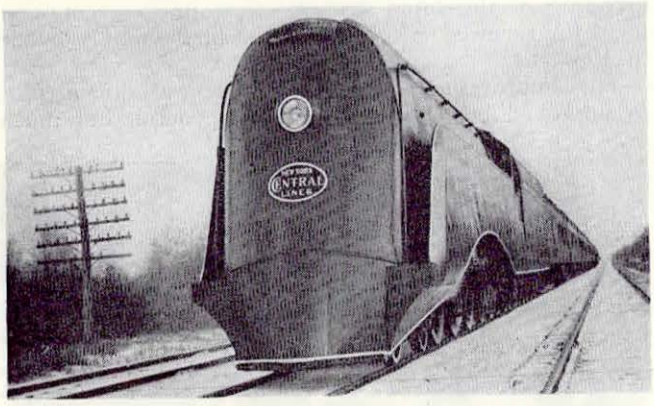
Then, in the fall, the continent was spanned at faster speed than a train had ever traveled before for such a distance, and new world speed records were established by the Diesel-powered six-car, streamlined train of the Union Pacific as it traveled from Los Angeles, Cal., to New York, 3,258 miles, in 56 hr. 55 min., from October 22 to October 25. The 2,298 miles from Los Angeles to Chicago were covered at an average speed of 59.2 miles per hour and the entire 3,258 miles at an average of 57.2 miles per hour. The maximum speed attained was two miles in one minute.

Regular Trains Speeded Up

Equally striking is the record being made by the "400," the new train of the Chicago & North Western. Following months of careful preparation, the C. & N. W. converted four 4-6-2 steam locomotives from coal to oil, and began the operation of a five-car train of standard equipment on a 7-hr. schedule between Chicago and

the Twin Cities on January 2, 1935. This schedule of 408½ miles in 420 min., an average speed of 58.35 miles per hour, is the fastest train schedule in the world for distances over 164 miles. The response to the inauguration of this train has been so favorable that, within the first month, it became necessary to add a sixth car daily to accommodate the passengers.

This train is scheduled to make the 85 miles between Chicago and Milwaukee in 80 min., a service that is the outgrowth of the 90-min. schedule for trains between those points that was put in effect in July, 1934, by both the C. & N. W. and the C. M. St. P. & P. The latter road, late in the year, further shortened this schedule by putting five of its trains on an 85-min. schedule for the 85 miles, or on a mile-a-minute basis, and late in January reduced this schedule for one of these trains to 80 min.



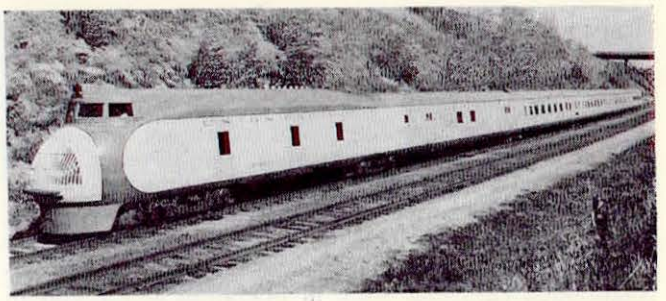
The Commodore Vanderbilt Is the First Locomotive to Be Streamlined

The Chicago-Twin Cities service promises to remain one of the fastest in the country, as the C. B. & Q. ordered two Diesel electric streamlined trains last fall which will be operated in this service on a 6½-hr. schedule. Meanwhile, the C. M. St. P. & P., also a competitor for this business, placed an order with the American Locomotive Company for the first two steam locomotives to be built new in streamline design. These will be used to haul light-weight standard equipment in the Chicago-Twin Cities service on a 6½-hr. schedule.

Following the record-breaking demonstration runs, the Chicago, Burlington & Quincy's Zephyr was placed in service between Lincoln, Neb., and Kansas City, Mo., 250 miles, on a schedule of 4 hr. for the 196 miles between Omaha and Kansas City, which requires operating speeds of from 75 to 80 miles per hour. On January 31, the Union Pacific will place its three-car streamlined train in regular service between Salina, Kan., and Kansas City, Mo., on a 3½-hr. schedule for the 187 miles. The U. P. plans also to place its Diesel-powered six-car train in operation between Chicago and the Pacific Coast in May, and to follow with two other similarly powered streamlined trains now under construction later in the spring.

As to locomotives, the New York Central, on December 14, placed in test service the Commodore Vanderbilt, the first steam locomotive to be converted by extensive streamlining. In contrast, the Atchison, Topeka & Santa Fe placed an order with the General Motors Corporation in November for a 3,600-hp. Diesel electric locomotive, the largest ever constructed, which will be used in pulling The Chief between Chicago and Los Angeles, Cal.

While the traveling public was being given the first benefits of high-speed steam and streamlined Diesel electric train service, there was also a marked speeding up of passenger trains in general. Thus, on May 20, the 56½-hr. Chicago-Los Angeles schedule was cut to 53¾ hr. by the Atchison, Topeka & Santa Fe, while the time eastbound was reduced from 56½ hr. to 55 hr. At the same time, the schedule of the Golden State Limited of the Chicago, Rock Island & Pacific and the Southern Pacific between Chicago and Los Angeles was cut from 61 hr. 10 min. to 58¾ hr. eastbound, while that of the San Francisco Overland Limited of the Southern Pacific, the Union Pacific and the Chicago & North Western from San Francisco to Chicago was cut from 61 hr. to 58 hr. 50 min. The schedules of other trains operated by these railroads between Chicago and the Pacific Coast were also speeded up, some as much as three hours. Likewise, the Chicago, Burlington & Quincy and the Union Pacific-Chicago & North Western, on October 14, reduced the running time of the Aristocrat and the Columbine, respectively, between Chicago and Denver, Colo., from 25 hr. 45 min. to 25 hr. 15 min. for the 1,047 miles.



The Union Pacific M-10001 Made the World's Long Distance Record—3,258 Miles in 56 Hr. 55 Min.

In the East the Seaboard Air Line reduced the time between New York and Atlanta, Ga., 35 min.; the time between New York and St. Petersburg, Fla., 25 min. southbound and 1 hr. northbound; and the time between New York and Miami, Fla., 45 min. The Pennsylvania's service between New York and Philadelphia was cut 5 min., or to 1 hr. 50 min. for the 91.3 miles. This railroad and the New York Central speeded up the schedules of a number of trains between New York and Chicago as much as one hour. A most interesting development in the East is the plans of the Pennsylvania and the Baltimore & Ohio to speed up service between New York and Washington still further during the next few months, when the Pennsylvania completes its electrification between these points, and the Baltimore & Ohio places in operation the high-speed streamlined trains, one with Diesel and one with steam power, that it now has under construction.

At the same time that the railroads have speeded up many of their existing trains, they have added new ones and restored some that were discontinued a few years ago. The Illinois Central restored its Panama Limited between Chicago and New Orleans, La., on a 20-hr. schedule on December 2. Early in the summer the Erie established the Lake Cities as a companion train to the Erie Limited between Chicago and New York. The Southern Pacific added a new train to its San Francisco-Portland service on a schedule of 19 hr. 59 min. northbound and 19 hr. 52 min. southbound, or about 1 hr. 30 min. less than the previous fastest schedule. The Seaboard Air Line, on October 28, placed its renovated and completely air-conditioned Cotton States Special in service between New York and Atlanta, Ga., on a faster schedule, while the Pennsylvania, on January 2, 1935,

placed a new train, the Florida Arrow, in operation between Chicago and Florida.

Increased Comfort

Aside from the speeding up of trains, the outstanding development in passenger transportation during the year was the rapid extension of the air-conditioning of passenger cars, including complete trains. As a result, 1,878 passenger cars, including 1,161 Pullman cars, were air-conditioned during the year which, with the 648 air-conditioned cars that were in operation at the end of 1933, brought the air-conditioned equipment at the service of the traveling public during the summer to a total of 2,526 cars. This program was supplemented in November by the announcement of plans to air-condition more cars for the summer of 1935. The western lines will air-condition 2,500 passenger cars of all types, with the result that every through train of any importance which is operated in the western territory will be air-conditioned throughout. Eastern lines will also air-condition additional cars until approximately 6,000 air-conditioned cars will be in service next summer.

In addition to these improvements to [illegible] more enjoyable for the public, comfort was further enhanced during 1934 by the construction of new cars of standard and light-weight design and the modernization of much existing equipment. A total of 387 new passenger cars were ordered by the railways in 1934 to replace obsolete equipment. This is the largest number of passenger train cars ordered by the railroads in any year since 1930. More extended efforts were also made in 1934 to modernize passenger equipment and as a result many cars were rebuilt and remodeled to include more attractive interior decorations as well as more comfortable seating, lounge and toilet facilities. The Boston & Maine, the Great Northern, the Illinois Central, the New York, New Haven & Hartford, the Southern Pacific, the Wabash and the Chicago & North Western alone reconditioned 1,370 passenger cars, while, in addition, the Pullman Company modernized 125 of its cars. The Chicago, Milwaukee, St. Paul & Pacific pioneered in the construction of light-weight standard passenger cars, building 75 all-welded coaches and baggage cars of this type. The interiors of these cars are finished in the most modern decorative schemes and appointments, while the weight of the cars has been kept at a minimum by the use of welded side sheets which eliminate the necessity for heavy car frames.

Other Passenger Service Improvements

Besides these material improvements, others, such as better solicitation and more liberal baggage allowances, were placed in effect. During the year many railroads concentrated more largely than ever before upon merchandising, and as a result there has been a marked improvement in the advertising of passenger service as well as in the relationship and understanding between salesman and the traveling public. Among the railroads that have added emphasis to merchandising are the New York, New Haven & Hartford, which established a department of sales and traffic development, and the Chesapeake & Ohio, which appointed a special representative to develop practical methods for ticket sellers in dealing with the public which are more pleasing to the public and of advantage to the railroad. Baggage allowances were made more liberal by all railroads, while scrip books for baggage were issued to enable passengers to carry excess baggage at low cost. The rate for shipping automobiles as baggage was reduced to one fare for the convenience of automobile travelers.

Pullman service likewise was improved in 1934. Besides reconditioning or modernizing 125 of its cars, the Pullman Company added 211 bedroom accommodations to its service. In addition, it installed, on certain lines, Pullman restaurant or buffet car service.

Passenger Traffic Recovery

The general rate reductions in the West were made late in 1933. It was in 1934, however, that their effect became most noticeable in passenger traffic. As a result of improved speeds and comfort, better salesmanship and reduced rates, the year 1934 marked a definite and an encouraging change in the trend of passenger traffic, which grew in volume throughout the year, the total being an increase of 5 per cent over last year. This is the first year since 1923 in which passenger traffic has not declined discouragingly and the arresting of the rapid decline offers much encouragement for renewed efforts along the lines of those made in 1934.

This improvement in traffic volume was due in part to improved business conditions in general, but much of the increase is attributable to the efforts of the railways themselves, for in no other year have the traveling comforts and conveniences of the public been developed by the railways as in 1934.

Many Passenger Cars Were Modernized During the Year—an Illinois Central Modernized Lounge Car

Freight Service Faster and More Convenient

Improvements in freight service in 1934 were scarcely less outstanding than those attending passenger service. Dispatch and convenience were more largely than ever before the aims of the railroads and to accomplish these objectives, faster schedules were inaugurated over the country generally and especially between points 200 to 300 miles apart. Between distributing centers and points within their entire trade area, overnight service, with late acceptance of freight at the shipping point and delivery at destination early the following morning, became the rule of many railroads' merchandise freight service in all parts of the country. Pick-up and delivery service was extended during the year, while steps were taken to meet the requirements of shippers and the need for efficient service by new and modernized equipment. A total of 24,609 new freight cars were ordered during

the year, the largest number since 1930, while 11 railroads alone reconditioned 31,791 cars. Several railroads pioneered in the development of light-weight freight cars through the use of aluminum and Cor-Ten steel.

Increased speed was also an important factor in freight service during 1934. A new fast service was established by the Pennsylvania in conjunction with the New York, New Haven & Hartford and the Boston & Maine, which provides third-morning delivery of shipments from the Middle West to New England points and first-morning delivery at these latter points from Potomac Yard, Va., this setup involving the daily operation into New York of high-speed freight trains from Chicago, from St. Louis, Mo., and from the South by way of Potomac Yard on schedules that are as rigid in their requirements as those of passenger trains. The Illinois Central, on March 22, established a 41-hr. freight schedule between Chicago and New Orleans, La., 921 miles, the new train being the fastest in its freight service with the exception of its banana trains. This railroad also, by adding several new dispatch freight trains and revising the schedules of existing service, established "double daily" freight service whereby shipments are handled regularly both morning and evening to and from all its principal terminals. In nearly all cases this "double daily" service effects a saving of from 12 to 24 hr. in deliveries. The Chicago & Eastern Illinois, the Louisville & Nashville and the Nashville, Chattanooga & St. Louis, on May 14, established second-morning arrival service between Chicago and the Southeast, the new schedule making possible connections with morning trains of all lines beyond Atlanta, Ga., with a consequent saving of 12 to 24 hr. in through service to principal points in Georgia, Florida and the Carolinas.

The New York Central's 7:30 p.m. merchandise freight train from New York to Buffalo, N. Y., 438 miles, was set up to a schedule of 10 hr. 15 min., or at the rate of 43 miles per hour, and cars are set out and picked up at four intermediate stops. An entire day was cut off schedules from Chicago to the Pacific Northwest, railroads now providing seventh-morning delivery. While many freight trains were operated at speeds as high as 60 miles an hour in 1934, the effect of the acceleration of freight service in general in that year is indicated by the average speed of *all* freight trains, which increased from a new high of 15.7 miles per hour in 1933 to 16 miles per hour in 1934.

Pick-Up and Delivery Extended

Besides this general speeding up of freight trains, freight service was further improved by the widespread extension of pick-up and delivery service. Express service, comprising the moving of merchandise on passenger trains at freight rates, was established by the Illinois Central on August 20 on that part of the railroad lying south of St. Louis and east of the Vicksburg, Miss., crossing of the Mississippi river. Likewise door-to-door pick-up and delivery service is now provided by the Railway Express Agency without extra charge at all points where it has such arrangements for its usual service. In the West, railroads now make storedoor delivery of automobiles shipped by rail to dealers in certain cities along their lines. The automobiles are carried by rail from the factory to the destination station and are then transported by trucks to the dealer's place of business. Somewhat similarly, the Chicago, Rock Island & Pacific, in 1934, established a "ferry" service between Chicago and Davenport, Iowa, so that truck trailers can be loaded onto flat cars and hauled to destination in time for early morning delivery.

Pick-up and Delivery Service Was Extended in Many Parts of the Country in 1934

While dispatch and convenience were developed to a great extent, the railroads also strove to make freight service more appealing. The Minneapolis, St. Paul & Sault Ste. Marie, for example, on August 20, established a uniform system of rates on l.c.l. shipments, with the charges based entirely on the weight of the package, without reference to the nature of its contents. This new blanket system of rate making applies between Soo Line stations in Illinois and destinations on its lines in Wisconsin, the upper peninsula of Michigan, Minnesota and the Dakotas. The rate is 60 per cent of the first-class rate and the charge includes both pick-up and delivery service. Several southwestern railroads, including the Atchison, Topeka & Santa Fe and the Missouri Pacific, established rates which afford small shippers of livestock an opportunity to ship by rail instead of by truck, under a plan whereby the animals, with proper markings, are picked up and transported to market as one shipment, the shipper thus securing the benefits of a carload rate for his l.c.l. shipment.

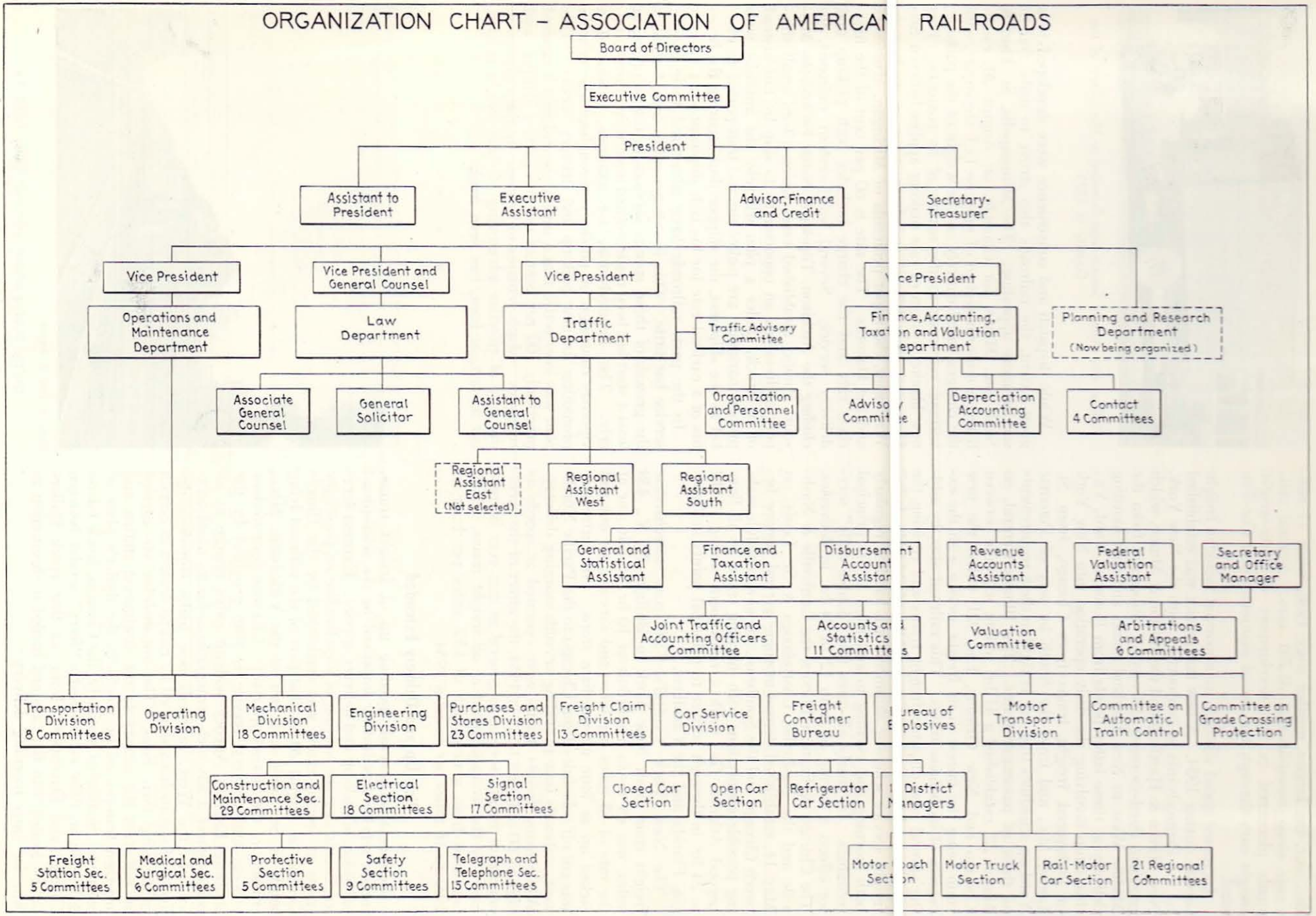
In the past, railroads have advertised their freight service but little. This is still generally true, but, with the growth of these special services to the shippers, at least a start has been made toward advertising them properly. The Pennsylvania, for example, conducted a vigorous campaign of publicity throughout the year in promoting its new pick-up and delivery service. This plan was so effective that a survey showed that it reached practically 100 per cent of the prospective shippers and receivers. Much remains to be done by the railways in the way of effective advertising of their freight service, but a start, at least, has been made.

* * *

Photo by Paul T. Warner

On the Reading's Main Line near Valley Forge, Pa.

ORGANIZATION CHART – ASSOCIATION OF AMERICAN RAILROADS



Association Of American Railroads

Progress being made in organizing the manifold activities of new set-up

By H. F. Lane
Washington Editor, Railway Age

ONE of the most important developments of the railroad history of 1934 was the formation of the Association of American Railroads, which became effective on October 12, to meet "the need for a forceful, independent organization to act in the capacity of a general staff for the railroads as a whole."

Considerable progress has been made in completing the central organization of the new association at Washington, which is grouped in five departments, and in co-ordinating with them the activities which had been carried on by the old organizations. Three of the departments, those dealing with Traffic; Finance Accounting, Taxation, and Valuation; and Planning and Research, are to deal with classes of activities not directly included in the functions of the Association of Railway Executives and the American Railway Association, and many problems of organization and procedure have arisen. Additional office space has been taken by the association in the Transportation building and the organization will be much larger than that which had been maintained there by the two associations.

The Organization and Its Functions

The accompanying chart shows the organization and functions of the association as of January 16, but is tentative only. The Department of Planning and Research is still being organized and additional organizations and functions will doubtless be added, while changes may be made in those now in existence as progress is made in adjusting the former organizations to the new set-up.

One of the objects of the formation of the new association was to co-ordinate the activities of the several associations dealing, directly or indirectly, with subjects connected with the American railroads. The Association of Railway Executives and the American Railway Association were merged into the new association at the time of its organization. The Bureau of Railway Economics is to be absorbed into the Planning and Research Department of the new association. The Railway Accounting Officers' Association ceased to function as an independent body on December 15; its functions are to be carried on as the accounting division of the Finance, Accounting, Taxation and Valuation Department, and a committee on organization and personnel, composed of three accounting officers and three treasury officers, has been appointed to outline a more permanent organization, rules of procedure, and personnel, for bringing into the new department the activities formerly conducted by the accounting officers' association and the Railway Treasurers' Association.

A large part of the organization of the American Railway Association has now become part of the Operations and Maintenance Department, including the Operating, Transportation, Engineering, Mechanical, Purchases and Stores, Motor Transport, Freight Claims and Car Service Divisions, with their subordinate sections or committees, as well as the Freight Container Bureau, the Committee on Automatic Train Control, and the Joint Committee on Grade Crossing Protection and the Bureau of Explosives. The plan contemplates that the various existing regional organizations and their related and subordinate organizations shall preserve their identities and activities, co-operating with the Association of American Railroads.

No Announcement of New Policies

No announcement has been made of any new policies adopted by the new association since its formation, although its board of directors and executive committee have held several meetings, but its officers and committees have numerous projects under way and in various stages of progress, including several referred to the railroads by Co-ordinator Eastman. The Operations and Maintenance Department and the board of directors of the association have devoted a great deal of study to the car-pooling plan proposed by Mr. Eastman's Car Pooling Section. The plan of the Section of Transportation Service for pooling and co-ordinating the handling of merchandise and express traffic, as well as several accounting problems, have also been the subject of study and conference with the Co-ordinator's organization. A special committee on grade crossings has maintained contact with government officials and furnished lists of projects for consideration in connection with the proposed program of grade-crossing elimination. The prospects for consideration at this session of Congress of a comprehensive program of transportation legislation, designed to bring about a co-ordination of regulation of all types of carriers, have also afforded scope for the activities of the association.

Research Advisory Board Appointed

Creation of the Research Advisory Board of the Association of American Railroads, the members of which are men outstanding in various fields of scientific work, was announced on January 23 by J. J. Pelly, president of the Association. The purposes include:

1. Assist in the organization of the new Department of Planning and Research which the Association is forming.

2. Advise as to plans not only for continuing research activities which the railroads already have in progress but as to plans for research which the Association has in contemplation.

3. Suggest new matters pertaining to operation, equipment or other activities connected with rail transportation to which definite attention should be given in the field of research.

The members of the board are:

Dr. Karl T. Compton, president, Massachusetts Institute of Technology.

Dr. Harold G. Moulton, president, Brookings Institution.

Dr. A. A. Potter, dean, Engineering Schools, Purdue University.

At meeting of board held Wednesday in Washington, Lawrence W. Wallace, vice-president of the W. S. Lee Engineering Corporation, Washington, D. C., and well-known consulting engineer, was selected as Director of Equipment Research.

Activities of the Co-ordinator in 1934

Little actual co-ordination accomplished but legislative program formulated for future

By H. F. Lane

Washington Editor, Railway Age

THE emergency transportation act of 1933, under which Joseph B. Eastman was appointed federal co-ordinator, has not yet produced very much co-ordination, but it has been the cause for a year and a half of very active and industrious investigation.

Under the present law the co-ordinator's term of office expires on June 16, having been extended for a second year by proclamation of the President upon the expiration of the original term last June, but it is expected that it may be continued under another law without some of the restrictions of the existing statute.

The principal accomplishment of the co-ordinator's organization so far has been the formulation of a legislative program for a new national transportation policy which it is rather confidently hoped may become law during the present session of Congress. Such legislative recommendations as were made last year were temporarily laid aside pending development of other phases of the subject while the Administration was devoting its attention to numerous other problems. Since then, however, Mr. Eastman has added to and perfected his legislative program and in numerous public addresses he has done much to pave the way for a sympathetic consideration of the program for co-ordinated regulation of all forms of transportation.

So far as actual co-ordination is concerned comparatively little has been accomplished, as yet, although in some instances suggestions emanating from the co-ordinator's organization have been voluntarily put into effect by the railroads and many studies are under way looking to co-operative action or pooling. Some of the more important reports of the co-ordinator's surveys have only recently been completed but some of those that have been issued have met with resistance among the railroad officers and on several occasions Mr. Eastman has asked them to reconsider in a less critical spirit.

But One Order Issued

Co-ordinator Eastman has issued but one order for the purpose of preventing an "unnecessary duplication." On October 25, contrary to the advice of the three Regional Co-ordinating Committees, he acted to prohibit the Louisville & Nashville from discontinuing the interchange of through passenger train equipment with the Chicago & Eastern Illinois at Evansville, Ind., and substituting such interchange with the Cleveland, Cincinnati, Chicago & St. Louis (New York Central). The proposed substitution was to have been made effective on October 28 as to trains between Chicago and Florida and other southeastern points.

After a controversy between the interested roads, which the co-ordinator had referred to the committees for investigation and any action they were prepared to make under the provisions of the act, Mr. Eastman issued a report and order including a finding that the proposed change would "result in unnecessary duplication of services and facilities and the elimination of a route now existing without the consent of all participating lines," would "unduly impair the net earnings of the Chicago & Eastern Illinois," and "result in wastes and preventable expense." The New York Central and the Louisville & Nashville sought to challenge Mr. Eastman's power to issue such an order by filing a bill of complaint in the federal court at Chicago asking for an injunction, which the court declined to grant.

Effects of the Labor Restrictions

So far as the immediate elimination of duplications and wastes is concerned, Mr. Eastman found his hands tied, when he became co-ordinator, by the provisions in the act which impose severe restrictions upon reductions in railroad employment and which, he has said, have converted his work very largely from action to research. The railroads have also felt the effect of those restrictions. The effect has been more restrictive than many have appreciated and to a large extent has changed the entire character of the administration of the law, as compared with that which had been planned. The employees who were in service in May, 1933, have an absolute protection against loss of employment or demotion "by reason of any action taken pursuant to the authority of this title."

The co-ordinator made a ruling which had the result of bringing within the range of Section 7(b) practically all co-ordination projects involving labor-saving economies. Because of this situation, no orders have been issued as to co-ordination projects and the co-ordinator's work has largely assumed the character of research into possibilities for the future.

In spite of the restrictions it seemed to Mr. Eastman that the new competition had so radically changed the conditions under which much railroad service must be furnished that the time was ripe for a thorough survey of operation, service, equipment, and rate-making policies. "While all of our conclusions may not ultimately be accepted," Mr. Eastman says, "I am confident that these surveys will serve a most useful purpose and that they will point the way to many helpful changes. To a certain extent they are irritating to the managements, but I believe they will all agree now, or later, that information well worth while has been secured. Opportunities of much money importance for economy through co-ordination and co-operation will be disclosed."

Mr. Eastman's First Reports

Mr. Eastman's first report was transmitted by the Interstate Commerce Commission to the President and to Congress on January 20, 1934, dealing with the question: "Is there need for a radical or major change in the organization, conduct, and regulation of the railroad industry which can be accomplished by federal legislation?" No specific recommendations for legislation were

then made, although some were suggested which were to be made more specific later. There are possibilities in the situation, Mr. Eastman said, which make it wise to postpone the immediate consideration of any radical or major change, and while he said that theoretically and logically public ownership and operation meets the known ills of the present situation better than any other remedy, he was not prepared to recommend resort to it. He expressed the hope that the railroads would be able to "form a more perfect union," which had its results later in the organization of the Association of American Railroads, and he suggested the continuation of an officer with powers somewhat like those of the co-ordinator.

On March 10 Mr. Eastman's second legislative report was sent to the President and Congress, recommending legislation for the federal regulation of water and motor carriers and four amendments to the interstate commerce act—to enable the commission to prescribe minimum as well as maximum joint rail-water rates and to establish through railroad rates regardless of the "short-hauling" of any carrier; to include ports and gateways in the protection of section 3 against undue preference and prejudice; to restore the fourth section to the form which it had prior to 1920; and to shorten the statutory periods of limitation with respect to reparation claims.

Mr. Eastman's expressions regarding government ownership were disturbing in many quarters and gave many the impression that he was working toward that end, although others believe that his principal purpose in his repeated references to the possibility of government ownership has been to keep constantly before the railroad managements the idea of the alternative which he thinks they face unless they display more energy in the direction of co-ordination.

The Co-ordinator's Organization

The co-ordinator functions through a principal office at Washington and regional offices established at New York, Chicago and Atlanta. The regional directors have charge of the investigation of operating and management economies local to the region. Since June 11 this work has been under the general supervision of V. V. Boatner as director of the Section of Regional Co-ordination. The regional directors also work with the carriers' Regional Co-ordinating Committees. The traffic assistants follow this work also, and are the point of contact for shippers. The organization at Washington is made up of five principal sections, (1) Section of Research, (2) Section of Transportation Service, (3) Section of Car Pooling, (4) Section of Purchases, and (5) Section of Labor Relations.

The Section of Transportation Service, J. R. Turney, director, has undertaken four major surveys in the field of transportation service.

Merchandise Traffic Survey

The report of the section on the Merchandise Traffic Survey was submitted by Co-ordinator Eastman to the Regional Co-ordinating Committees on March 22, with a request that they report back by June 1. The report was first referred to committees in each of the three regions consisting of three operating, three traffic, and three accounting officers. They made a report indicating differences of opinion between the co-ordinator's staff and the railroads and after a time extension a committee of traffic vice-presidents was appointed for further study of the subject. Later still another committee was appointed for further conference with the co-ordinator, but the railroad viewpoint has not been made public. The recommendations embodied in the report were as follows:

1. Consolidate rail L.C.L., express and forwarder traffic and pool all rail merchandise services into two competing merchandise agencies, under contracts encouraging direct and economical routing but protecting the revenues of each participating carrier.

2. Collect and deliver merchandise and transport it in shock-proof equipment at overall speeds in excess of 20 miles an hour.

3. Simplify classification, liberalize packing requirements and adapt the express system of charges by substituting for present scales a scale based upon cost plus a fair profit.

4. Co-ordinate rail and highway tranportation, so that merchandise will be concentrated at and distributed from a limited number of key concentration stations by highway and moved between such stations by rail in car lots.

Passenger Traffic Survey

The report of the Passenger Traffic Survey was transmitted to the Regional Co-ordinating Committees on January 17 and made public on January 21. It is a critical analysis of the defects in the present methods of conducting the passenger business of the railroads with far-reaching recommendations for their correction.

The Section finds that the flight of passenger traffic from the railways is due to failure to keep pace with modern methods of marketing, servicing, pricing and selling, and proposes that the Association of American Railroads be charged with sole responsibility for "the re-creation of an American rail travel market," and specifically for a continuous aggressive campaign of national and local advertising, good will, institutional, promotional and specific; and for the planning, conduct and supervision of the sale of passenger transportation.

It is recommended that the service be modernized and placed on five bases of fare, 1½ cents a mile for fast local service, co-ordinated with highway carriers; 2 cents a mile for intercarrier limited service; 3 cents a mile for reserved service, including berth; 5 cents a mile for de luxe service, and quantity discounts for parties, traveling salesmen, etc. The report says that present high fares are in large measure responsible for unprofitable rail operations and have put rail travel out of the reach of most people.

Carload Traffic Survey

The principal objectives of the Carload Traffic Survey, on which a report is expected early in the year, are:

1. To determine the volume, the origin and destination of available traffic, and the distribution thereof, between the several transportation agencies.

2. To analyze the methods, practices, service and costs of the terminal operations of each transportation agency and determine the economic utility of each.

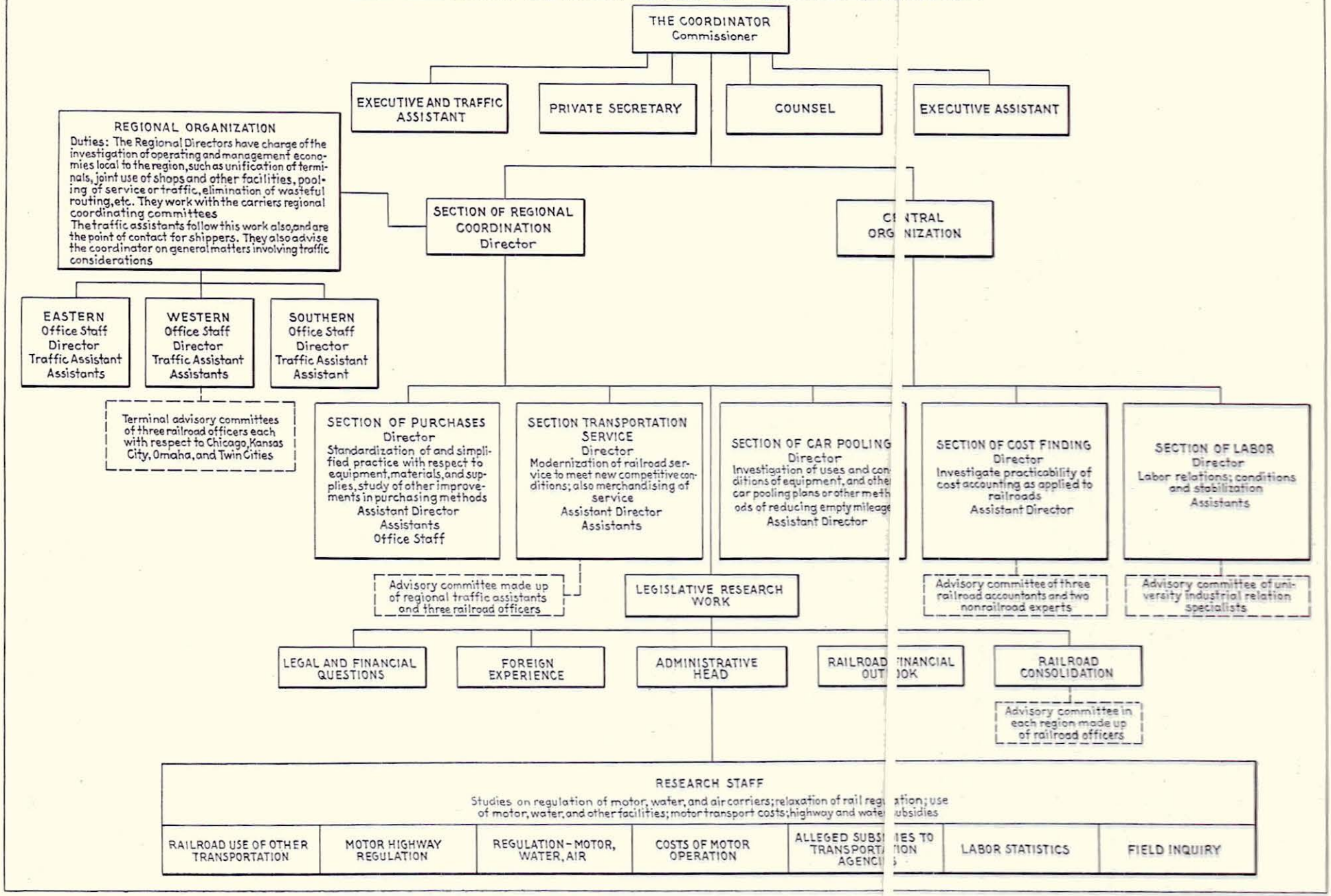
3. To analyze the facilities, methods, practices, service, and costs of line-haul operations of each agency and determine their respective economic utilities.

4. To determine the relative utility of equipment units, presently and potentially available, with respect to dimension, capacity, minimum loads, convenience, and economy in loading and unloading, and protection of the lading while enroute against the elements, vibration, shock, and loss.

5. To ascertain the service needs of shippers with respect to facilities, equipment, speed, and completeness of movement.

6. To determine the extra transportation expense incurred by the shippers in (a) furnishing and maintain-

THE FEDERAL COORDINATOR OF TRANSPORTATION


THE COORDINATOR
Commissioner
EXECUTIVE AND TRAFFIC ASSISTANT
PRIVATE SECRETARY
COUNSEL
EXECUTIVE ASSISTANT
REGIONAL ORGANIZATION
Duties: The Regional Directors have charge of the investigation of operating and management economies local to the region, such as unification of terminals, joint use of shops and other facilities, pooling of service or traffic, elimination of wasteful routing, etc. They work with the carriers regional coordinating committees
The traffic assistants follow this work also, and are the point of contact for shippers. They also advise the coordinator on general matters involving traffic considerations
SECTION OF REGIONAL COORDINATION
Director
CENTRAL ORGANIZATION
EASTERN
Office Staff
Director
Traffic Assistant
Assistants
WESTERN
Office Staff
Director
Traffic Assistant
Assistants
SOUTHERN
Office Staff
Director
Traffic Assistant
Assistant
Terminal advisory committees of three railroad officers each with respect to Chicago, Kansas City, Omaha, and Twin Cities
SECTION OF PURCHASES
Director
Standardization of and simplified practice with respect to equipment, materials, and supplies, study of other improvements in purchasing methods
Assistant Director
Assistants
Office Staff
SECTION TRANSPORTATION SERVICE
Director
Modernization of railroad service to meet new competitive conditions; also merchandising of service
Assistant Director
Assistants
SECTION OF CAR POOLING
Director
Investigation of uses and conditions of equipment, and other car pooling plans or other methods of reducing empty mileage
Assistant Director
SECTION OF COST FINDING
Director
Investigate practicability of cost accounting as applied to railroads
Assistant Director
SECTION OF LABOR
Director
Labor relations; conditions and stabilization
Assistants
Advisory committee made up of regional traffic assistants and three railroad officers
LEGISLATIVE RESEARCH WORK
Advisory committee of three railroad accountants and two nonrailroad experts
Advisory committee of university industrial relation specialists
LEGAL AND FINANCIAL QUESTIONS
FOREIGN EXPERIENCE
ADMINISTRATIVE HEAD
RAILROAD FINANCIAL OUTLOOK
RAILROAD CONSOLIDATION
Advisory committee in each region made up of railroad officers
RESEARCH STAFF
Studies on regulation of motor, water, and air carriers; relaxation of rail regulation; use of motor, water, and other facilities; motor transport costs; highway and water subsidies
RAILROAD USE OF OTHER TRANSPORTATION
MOTOR HIGHWAY REGULATION
REGULATION - MOTOR, WATER, AIR
COSTS OF MOTOR OPERATION
ALLEGED SUBSIDIES TO TRANSPORTATION AGENCIES
LABOR STATISTICS
FIELD INQUIRY

ing sidings, platforms, docks, etc.; (b) packing, crating, billing, etc.; (c) drayage.

7. To study the present and potential economic relationship between carload charges and transportation costs with respect to the various kinds of traffic.

This survey will consider the possibilities of improving service which may be opened up by the use of interchangeable containers or demountable truck bodies and the development of light-weight equipment. A mechanical advisory committee of highly experienced men is at work on these and other similar possibilities.

Marketing Survey

In the Marketing Survey now under way investigation and analysis will be made of the traffic organizations of representative systems, and also common or joint agencies and bureaus. Investigation will be made of the rate-making machinery, to see if further means of simplification and of economy in pricing procedures and methods can be found. Methods and costs as well as regulatory requirements in compiling, checking, revising, printing, and publishing tariffs will be analyzed and examined, with a view to making tariffs more intelligible to patrons and less expensive to carriers. Methods of selling transportation and of soliciting traffic will be examined. Personnel, costs, sales efforts, methods of control, productivity, and market possibilities will be reviewed. Advertising policies and media will be examined, particularly with respect to the substitution of advertising in part for direct sales efforts. Finally the need and potentialities of market research and development by carriers individually and in co-operative groups will be explored.

Car Pooling Recommended

The function of the Section of Car Pooling is to determine whether it is feasible and desirable to extend the principle of pooling to all or any classes of equipment, and also to consider alternative means of reducing empty car mileage and other questions arising in connection with the use and maintenance of equipment. On October 23 Co-ordinator Eastman submitted to the Regional Co-ordinating Committees a report of the section prepared under the direction of O. C. Castle, director, and N. D. Ballantine, assistant director, recommending the immediate formation of an organization, to be controlled by the Association of American Railroads, for the operation of all box cars, except ventilated and automobile box cars, in a nation-wide pool, as the initial step toward the development of a more comprehensive plan. The ultimate objective as stated is to acquire ownership of cars assigned to the pool, together with necessary facilities for repairing cars, and to assume full responsibility for providing and maintaining a car supply adequate for the needs of shippers on all participating railroads, but for the initial step a lease or contract basis was proposed. The report included estimates of possible savings of $75,000,000 a year by prevention of unnecessary empty-car mileage and of $25,000,000 a year in capital carrying charges through coordination of operation and purchases.

The report includes a complete plan of organization and rules of operation for the proposed freight car pool accompanied by a footnote saying the plan as presented is designed to meet conditions of voluntary action by the railroads, and that some changes in form and detail would be necessary "if the plan is to be made effective by a formal order or legislative enactment."

This has been given serious study by the Association of American Railroads, through its Department of Operations and Maintenance, which has undertaken a nation-wide special check and study of the actual daily movement of freight cars on all railroads.

In considering plans for car pooling the section has also made inquiries into the condition of freight cars and the need for replacements and repairs, and this was later extended to a study of steam locomotive condition and programs for repair and retirement and a check of the condition of stored equipment. Several reports on the results of these studies have been made public for the benefit of railroad officers and others interested.

Section of Purchases

The general purpose of the Section of Purchases, R. L. Lockwood, director, is to promote economy in the selection and procurement of railroad physical property. Its work has been directed primarily toward standardization and simplification by reduction in the variety of specifications, designs, types, sizes, and other features of physical items and in variety of methods and practices and concentration on the smallest number of different items required for adequate performance; and toward improvement in purchasing methods. Its work has included studies of means for eliminating wasteful practices, such as reciprocal buying, uneconomical routing, and selection of material without adequate knowledge or consideration or ultimate quality.

In July, 1933, the section began a detailed study of the organization and methods of the purchasing and stores departments of the railroads, with the co-operation of officers and members of Division VI, Purchases and Stores. The results of the studies indicated the need for closer co-operation among the railroads in connection with purchasing, and for interchange of information regarding prices, terms, routing of materials, and adherence to A.R.A. standards. It was therefore decided that, during an indeterminate trial period, actual purchase orders should be reviewed by a committee of Division VI and by the Section of Purchases.

A Reviewing Board Committee of purchasing officers was appointed by Division VI. Purchase orders issued by six railroads during May, June and July, 1934, were analyzed and tabulated. After thorough study and discussion by the committee, they were turned over to the Section of Purchases for further study, together with comments and suggestions. The results indicated that differences in prices of the great majority of items were insignificant. The only substantial differences occurred in the case of certain low-priced items bought in small quantities. It was evident that no important savings could be expected through attempting to eliminate minor differences in price on small items, and that items representing more than 90 per cent of dollar volume were substantially uniform in price at the point of use, after making necessary adjustments for off-line and on-line transportation costs. After three months' trial it was agreed that the review plan as originally conceived could not be expected to produce results commensurate with its cost. It was the consensus that the real opportunity for saving lay in those items bought largely under contract, and that such contracts, and purchasing and routing practices in connection with such commodities, could be reviewed most effectively through a "random check" method.

At the meeting of the Reviewing Board Committee in August, 1934, it was agreed that the most feasible plan would be to extend the group meeting idea to cover all railroads. After approval by the Reviewing Board Committee, by officers of Division VI, by the Section of Purchases, by the general committee of Division VI,

and by the president of the American Railway Association, the "Regional Group Plan" was set up under the auspices of Division VI and the Section of Purchases. This provides for the establishment of six regions covering all railroads in the United States. A chairman was appointed by Division VI for each regional group. All the members of the Regional Review Board Committee were requested to function as a national Purchasing Advisory Committee. The director of the Section of Purchases has attended each meeting, also the Secretary of Division VI. Among the subjects brought up for discussion was that of possible economies to be gained through joint purchasing of certain commodities, and through concerted action in respect to estimating requirements in advance, to the end that costs and prices of certain items might lowered to the advantage of both vendor and purchaser.

During the latter part of 1933 and in 1934, a number of informal meetings of stores officers were held in the eastern region for the purpose of comparing methods and costs in the handling and distribution of stores and supplies. It was reported by those who attended that the results had been extremely beneficial and had resulted in the adoption by certain roads of practices which had proved economical in the stores departments of other roads. The vice-chairman of Division VI, who had been instrumental in conducting stores meetings in the Eastern region, was requested to organize stores groups in the six regions now set up, with a chairman for each group reporting to the chairman of the purchasing group in that region, and to include all railroads in the regional group. The six chairmen have since been appointed, and several meetings of stores officers have been held, some of them at the same time and place as the meetings of the purchasing officers.

A study has also been made of shop equipment now in use by the railroads, to determine the degree of economy which could be secured if the equipment were modernized.

Closely related to the work of the Section of Purchases was the organization on December 18, 1933, of a joint committee composed of a committee of railroad executives and another appointed by the Science Advisory Board of the National Research Council to study the matter of scientific research for the railroads, which on October 9 submitted a report to the co-ordinator unanimously recommending the establishment of a research organization competent to deal with the major material problems of common interest. About the same time the railroads indicated a willingness to make an effort to carry out the plan by adopting as part of the plan for the organization of the Association of American Railroads a provision for a Department of Planning and Research.

Section of Labor Relations

Section 13 of the act directs the co-ordinator, in considering needs for further legislation, to investigate, among other things, the "stability of railroad employment and other improvement of railroad labor conditions and relations." The Section of Labor Relations, O. S. Beyer, director, was set up primarily to conduct such an investigation. The co-ordinator has no other authority in connection with labor, although he was called on by the President to act as mediator in the dispute regarding the restoration of the 10 per cent wage cut agreed upon in January, 1932. He has also attempted to bring about compliance with the provisions of the law relating to "company unions" and had much to do with the amendments to the railway labor act.

Some of the other investigations and special studies undertaken by the Section of Labor Relations, briefly summarized, are as follows:

1. Labor relations on the railroad-controlled refrigerator car lines, railway express companies, and the Pullman Company have been investigated and data secured for use in connection with legislation.

2. A survey of minimum wage rates and maximum hours of the lower-paid employees in the railroad industry.

3. The Section of Labor Relations in conjunction with an advisory committee has been engaged in an extensive study of plans designed to provide reasonable security for railroad employees who would otherwise be adversely affected by technological improvements, co-ordination of railroad facilities and services, or mergers and consolidations.

Early in the consideration of economic security for railroad employees it became apparent that such expedients as dismissal wages, pensions, and unemployment benefits could not be adequately analyzed as to cost without a survey of employment experience. While a relatively small sample of employment histories was [illegible] $384,000 provided by the Civil Works Administration made it possible to procure a much larger cross-section. The undertaking, among other things, gave employment to about 2,000 clerks for a limited period in transcribing data from the employment records of 13 railroads, all of which co-operated in the work. Later an additional allotment of $140,000 was made by the P.W.A. to complete and supplement the work.

The section has also been making an analysis of the various elements of cost and the reasons for such costs resulting from certain types of rules incorporated in working agreements between the railroads and labor organizations, particularly in train and engine service.

Cost Finding

Section 13 of the act requires the co-ordinator to investigate, among other things, "cost finding in rail transportation." This matter was considered extensively some few years ago by the Interstate Commerce Commission, and lengthy public hearings were held at which sharp conflicts of opinion developed. It had become apparent to Mr. Eastman that a method of inquiry akin to scientific research was needed, including tests and experiments. The co-ordinator has endeavored to carry on the present inquiry in this way. It was put in charge of John H. Williams, a man experienced in cost finding in other industries, assisted by C. H. Crandall, one of the leading accountants of the commission's staff. He has been assisted, also, by an unpaid advisory committee made up of three railroad officers experienced in accounting and two non-railroad men who have given much study to cost-finding methods.

All cost-finding plans previously suggested for railroad use were studied at the outset. Upon analysis, it was found that they represent very little other than an expansion of the accounting now in use, were it carried to its logical conclusion. The difficulty with all of them is in prescribing adequate rules for the distribution of expense, the extent and complexity of the work itself, and the terms in which the final results are expressed. In October, 1933, the section submitted to the advisory committee a rough outline of a plan that seemingly met the above objections. The committee expressed itself as believing the proposed plan to offer better prospects than any other that had previously been developed, and to be well worth trying out. Since then, details of this plan have been worked out, and information for the

year 1932 was assembled from the New York Central, the Chesapeake and Ohio, the Denver & Rio Grande Western, and the Delaware, Lackawanna and Western for the purpose of making a practical test of the plan. The plan will be subjected to the criticisms of shippers, the railroads, and the commission accounting staff before it is finally recommended to the co-ordinator.

The Research Staff

This staff has been assisting the co-ordinator in the study and investigation of matters which have a bearing on the need for further transportation legislation. The work done by Leslie Craven in the study of the legal phases of consolidations, including the extent to which the government may enforce them and into the opportunity for improving the present system of public regulation which such consolidations might open up, was described in the report of January 10. The investigation made by William B. Poland of the so-called "Prince Plan" of railroad consolidation was also described in that report. Mention was likewise made of the canvass of available information in regard to the railroads of other countries. It covers the ownership and manner of operation and regulation of such railroads, including the reasons for public or private ownership and operation and the results achieved. It also covers competition between the railroads and waterways or motor vehicles, and the steps which have been or are being taken to control or regulate these other transportation agencies. The remainder of the Research Staff has been working under the general direction of Dr. C. S. Morgan, economist of the commission, in the investigation of questions which relate chiefly to transportation agencies other than the railroads.

The Regional Staff

More difficulty has been encountered in the work of the Regional Staff than in any other branch of the co-ordinator's work, Mr. Eastman has said. It has to do with such economies as are possible through unification or co-ordination of terminal operations, joint use of shops, stations and other facilities, the pooling of traffic or service, the elimination of wasteful routes, etc. This was the field of economy through co-ordination which the carriers had particularly in mind at the time when the emergency act was under consideration by Congress, and they were preparing to proceed vigorously and expeditiously with it. In fact, organizations for the purpose of searching out such opportunities for economy had been developed, or were in process of development, when the act was passed. These economies, however, are very largely labor-saving in character, and the restrictions on reduction in labor employment, as they were interpreted and applied by the co-ordinator, put a stop to immediate accomplishment in this direction. The carriers felt that the co-ordinator had gone unnecessarily far in his endeavor to keep good faith with Congress with respect to these restrictions. The co-ordinator was insistent that the search for possibilities of economy through such co-ordinator should go on, and he has said that his regional directors have worked hard toward that end.

Accounting Problems

On April 4 the co-ordinator addressed a communication to the Regional Co-ordinating Committees calling attention to the excessive complexity and uncertainty of the arrangements between the carriers for the division of joint rates, and to the unnecessary expense in the settlement of inter-line accounts thus imposed upon them, suggesting the appointment of a committee to study the matter. Prior to the receipt of this communication, the Advisory Committee of the Association of Railway Executives had appointed a committee of 21 traffic executives and accounting officers to study this question, among others, and the co-ordinating committees jointly agreed to ask this committee for a report on the subject of simplified divisions. The committee made such a report to the chairman of the Association of Railway Executives, which contained definite recommendations for the simplification of divisions and related matters over a trial period. The Advisory Committee approved this report, it was approved by the Class I roads and also by the American Short Line Railroad Association, and the recommendations were then made effective with the accounts for June.

A comprehensive memorandum dealing with the subject of a clearing house for the settlement of inter-road accounts of the railroads was sent by the co-ordinator on March 30 to the Regional Co-ordinating Committees with a request that they provide at once for a thorough study of the subject by an appropriate committee of finance and accounting officers. The memorandum was prepared at the co-ordinator's request by N. B. Haley of the Bureau of Finance of the commission. On November 1 the railroad committee reported, rejecting the clearing house proposal, either on a national or regional scale, but recommending a method of effecting more prompt settlements between carriers through the extension of the net settlement plan such as is now partially in effect, to include other charges and credits. Mr. Eastman then sent to the committees a report by Mr. Haley commenting on the railroad report, together with a suggestion that the subject be studied through the Association of American Railroads by qualified men wholly dissociated from individual roads. In his letter Mr. Eastman said that something had been accomplished but that the report of the special committee was far from satisfactory. The matter is now being considered by the Department of Finance, Accounting, Taxation, and Valuation of the association.

Matters Relating to Accessorial Services

On April 5 the co-ordinator transmitted to the Regional Co-ordinating Committees a memorandum prepared by Director Bartel of the Bureau of Service of the Interstate Commerce Commission and approved by Director Hardie of the Bureau of Traffic and Director Bonneville of the Bureau of Inquiry containing recommendations designed to bring about better supervision of the application of demurrage and storage rules throughout the country and thus obtain substantial savings in net revenues for the carriers. This matter was referred to the general committee of the American Railway Association, which submitted a report which failed to satisfy the co-ordinator's organization and the matter was referred back to the committees on November 3 with a request for more thorough consideration in the light of a memorandum prepared by C. E. Bell, Mr. Eastman's executive and traffic assistant.

One stated purpose of the emergency transportation act is to "control allowances, accessorial services and the charges therefor, and other practices affecting service or operation, to the end that undue impairment of net earnings may be prevented." When the act was passed, the commission was engaged in certain comprehensive investigations bearing on these matters, these inquiries being in charge of its Bureau of Service. The Co-ordinator planned, therefore, to deal with these allowances and charges with the assistance of that bureau.

Photo by H. Armstrong Roberts

The Outlook for Transportation Legislation

Co-ordinated regulation of competing carriers appears probable

By H. F. Lane

Washington Editor, Railway Age

PROSPECTS appear favorable for the enactment at this session of Congress of legislation, such as has been urged by the railroads for several years, to remove some of the handicaps under which they have operated because they have been strictly regulated by the federal government while their principal competitors on the highways and waterways have not only not been regulated, so far as interstate commerce is concerned, but have been encouraged and aided by virtual government subsidies.

In his address to Congress on January 7 President Roosevelt outlined a program of proposed permanent measures intended to supersede much of the temporary and emergency legislation of the previous two years. In doing so he gave a definite place in the program of the Administration to comprehensive transportation legislation. This is expected to result in a transportation act of 1935 which will not only supersede the emergency transportation act of 1933, with its hampering restrictions on economy projects that would temporarily reduce employment, but also to some extent the provisions of the transportation act of 1920 and even of the interstate commerce act itself.

President Roosevelt Expected to Deal with Transport in Special Message

Only part of a single sentence was devoted to transportation in the President's address, which was confined mainly to an outline of principles and purposes, because the President expected to send to Congress a special message dealing with the subject in specific detail later on, after Co-ordinator Eastman's recommendations should have been made public. However, what he did say was regarded as the signal to "go," because first place among the "other measures of national importance" that "lie immediately before us," which were mentioned after the discussion of the public works program which was the main topic of the address, was given to "consolidation of federal regulatory administration over all forms of transportation."

This referred to the recommendations which had been made to the President informally by Co-ordinator Eastman as well as to those in a report of a committee of Cabinet officers for a reorganization of the Interstate Commerce Commission amounting practically to the creation of a new "super-commission," to have regulatory jurisdiction over all agencies of interstate transportation. The proposals are described in complete detail in Co-ordinator Eastman's reports. The plan is not exactly that proposed by the railroads, nor is it intended for their sole benefit, but it is designed to accomplish their principal purpose of bringing competing transportation agencies under a form of regulation comparable to that under which they have been restricted, since it appears impracticable to obtain any great relaxation of existing regulation, so that the conditions of their competition will be more nearly equal.

Regulation Proposed As Substitute For Competition

One of the primary purposes of the government advocates of the plan, however, is to substitute regulation for much of the competition, both that between competitive forms of transportation and that among carriers of one type with others of the same type, and to promote the co-ordination of all forms of transportation. This is in part a recognition of the injustice involved in the system which has prevailed heretofore of trying to regulate the railroads both by law and commission rulings and by fostering outside competition in addition. Moreover, part of the plan is to continue an organization somewhat like that of the co-ordinator to act as a planning agency in an effort to bring the various forms of transportation into closer co-operation with each other.

Now that the President has made transportation legislation a definite part of his program it is believed that its enactment is almost assured, although there will be opposition, as to many features, and the plan is liable to changes in the process. In his address at Salt Lake City before he was elected Mr. Roosevelt indicated a strong desire to try his hand at solving the perennial transportation "problem," and advocated regulation of competing carriers, but because of the complexity of the problem, at least from the standpoint of reconciling the numerous conflicts of interest concerned with it, and the pressure of so many others, he has from time

to time deferred taking hold of and acting upon it.

In 1933 the emergency transportation act was passed and Mr. Eastman was appointed co-ordinator on the theory that he would be able to effect some improvement in the situation of the railroads while formulating a plan of more permanent legislation. The labor restrictions inserted into the act before it was passed have postponed most of the economies then under contemplation and in 1934, after Mr. Eastman and the Interstate Commerce Commission had concurred in recommending regulation of highway and waterway transportation, it was again found necessary to postpone action and Mr. Eastman's term was extended for another year.

Meanwhile Mr. Eastman and his organization have continued their studies and, moreover, Mr. Eastman, in his numerous addresses in various parts of the country and before groups of various kinds, has done much to crystallize opinion in favor of the idea of co-ordinated transportation regulation. His presentation of the idea from the public standpoint has also done much to overcome the impression that it represented merely an effort to protect the railroads from competition by showing that a proper policy of regulation is not only necessary to avoid chaos but would possess advantages for all forms of transportation.

Much of Opposition Overcome

It is believed that much of the former opposition to regulation of water and highway carriers, particularly on the part of shippers who for a time enjoyed the possibilities of playing one carrier agency against another, has now been overcome, as indicated by the resolution adopted by the National Industrial Traffic League at its annual meeting favoring regulation of highway carriers. Also, representatives of carriers of all types have come to concede the need for some kind of public regulation and many of the truck and barge operators now favor such regulation by a single commission, although others want separate commissions.

The bus operators have long advocated commission regulation but in the past year have indicated some preference for code regulation of rates. It is believed, also, that the chances for passage of the proposed legislation have been greatly improved by the developments which have combined the separate bills previously considered into a single comprehensive program, approaching the subject from the standpoint of a new transportation policy.

Regulation will be opposed by the manufacturers of motor vehicles and many of the bus and truck operators have hoped that so-called "self-regulation" under codes might be allowed to take the place of commission regulation of rates, but such opposition will be far less effective than if concentrated against a single bill. However, Mr. Eastman is understood to have devised a plan by which codes would still play an important part, possibly being transferred to the jurisdiction of his proposed new organization. He has held out a possible compromise by saying that there are certain desirable things, not inconsistent with commission regulation, which can often be better accomplished by a code than in any other way. He said the opportunity to accomplish such results should be open and that there is no reason why a transportation industry in its code should not undertake self-regulation of rates, so long as regulation of rates by the commission is not precluded.

In the past the railroads have been generally regarded as the proponents of bills to regulate their competitors, although the Rayburn motor carrier bill of last session was that of the state commissions and was favored by the Interstate Commerce Commission. Now the plan has developed far beyond the point of a representation of any partisan interests and the legislative campaign of the railroads can be devoted mainly to support of its principal objectives and to efforts to oppose detail proposals which they deem unwise, aside from the necessity of opposing the bills proposed by the railroad labor unions to require the employment of more men.

Railroads to Oppose Labor Program

Their principal desires are for approximately equal regulation of their competitors and a modification or repeal of the long-and-short-haul clause of Section 4 of the interstate commerce act. Mr. Eastman has also been willing to modify the fourth section. The railroads are also preparing to oppose the bills advanced by the railroad labor organizations, designed to require the employment of more men and to shorten the number of hours to be worked for a day's pay, which would increase their operating expenses by enormous amounts, and Mr. Eastman has expressed his disapproval of some of them in plain language, although he advocates other measures to improve the condition of railroad labor as well as the relations between labor and management, including a pension plan and a system of dismissal compensation.

Other Proposals

Other features of the legislative program to be considered which concern the railroads especially include a revision to correct the demonstrated weaknesses of the bankruptcy law in relation to railroad reorganizations and further legislation regarding railroad consolidations, which was discussed tentatively in Mr. Eastman's report of last year and has been further developed during the time since by Leslie Craven, his counsel.

Railroads are also interested in the inclusion of a grade crossing elimination program in the President's huge plan for re-employment of persons on relief, and in the bill to broaden the powers of the R. F. C. to make loans to railroads.

It is assumed that the labor restrictions of the emergency transportation act will disappear with the expiration of the act on June 16, to be replaced with some provision for reasonable indemnification against the hardships involved in the temporary displacement or transfer of labor in connection with economy projects.

It is understood that Mr. Eastman's report on subsidies to various forms of transportation has been so delayed that his recommendations for any legislation on the subject may come too late to be considered at this session of Congress.

Press of Other Business an Obstacle

It now seems likely that the principal obstacles to the passage of the proposed transportation legislation at this session may lie more in the multitude of other subjects clamoring for the attention of the lawmakers or of the projects for which they are clamoring, which will reduce the time available for consideration of any one subject, than in direct opposition.

Many other features of the Administration's general program will have to go before the same committees that will handle the transportation bills, and, moreover, the Railway Labor Executives' Association is strenuously pressing an extensive program of bills, including some on which extensive hearings were held last year, of the kind which always causes a large element in Congress to sit up and take notice. Their program includes a six-hour day bill, a train-limit bill, a full-crew bill, amendments to the employers' liability act, an inspection bill, and amendments to the hours of service law to reduce the limit from 16 to 12 hours, but it is believed that Mr. Eastman's opposition to the idea of imposing such addi-

tional handicaps on their own form of transportation will have considerable weight. Of course, there has been as yet no specific public evidence, beyond the general idea conveyed in the President's message, that he will be guided by the advice of Mr. Eastman and of the office created by law to furnish official advice on the subject, at the expense of the railroads, rather than by some of the ideas that have been fermenting in the Department of Commerce or the outer fringes of the "brain trust." However, there have been some indications that Mr. Eastman's program is at least to furnish the basis for the official program.

Some "Brain-Trusters" Ready to Furnish Government Ownership Plan

Among the so-called "brain-trusters" there are some who would be very glad to furnish a scheme for government acquisition of the railroads at a very low price at the drop of the hat and some people have believed that Mr. Eastman was secretly in league with them, but he has said he was unwilling to recommend such a plan unless it is sufficiently backed by a body of public opinion [illegible] to afford effective protection against the dangers of politics, and that as yet he had seen no satisfactory evidence of such opinion.

The general purpose of a plan of co-ordinated regulation has been described by Mr. Eastman as follows:

"Each form of transportation is entitled to equal consideration. It is not a question of protecting one group of carriers against another, but of securing for the nation the best possible transportation. It is, in short, not a railroad problem, nor a truck problem, nor a waterway problem that we have to solve—but a transportation problem.

"Experience has proved that in transportation free and open competition without let or hindrance does not protect the public but instead does it harm. For many years we tried it with the railroads and it did not work. Nor will such a system work with any other group of carriers, even if that particular kind of transportation could be considered all by itself. But the fact is that no means of transport is isolated, and each must be considered in its relation to others. The transportation system of the country is a unit. The various agencies interlock and react, one against another, in a multitude of ways. The system cannot permanently be half regulated and half unregulated.

"Public regulation of the railroads is of benefit to the other carriers, and can be made of even greater benefit. Some of the water lines could not have survived, except for the joint through rates with their rail connections which the commission has required. If its jurisdiction were extended, similar joint rates could be required between the railroads and highway carriers with much advantage to both.

"To my way of thinking, co-ordinated regulation is the only answer. The ideal is plainly a national transportation system which will utilize each means of transport to the best advantage, encouraging its use in the service to which it is best fitted, discouraging its use in service to which it is not well adapted, promoting co-operation and the utmost co-ordination which will be of advantage, establishing order in place of disorder, preventing competition from assuming wasteful and destructive forms, and in short endeavoring to build up a system which will be sound economically and financially, be able to supply the best service at the lowest reasonable cost, and keep up with the march of the times.

"Of course we shall fall short of this ideal, but if the regulatory authority is to make the best possible progress in this direction, clearly it must have a knowledge and a jurisdiction which will cover the entire situation. It must know what the trucks, the buses, the steamships, the barges, the pipe lines, and the airplanes can do, as well as the railroads, and how all of these means of transport are or can be inter-related with public benefit. It must know what the costs are of the services which these various forms of transportation can furnish. If it is asked to fix a bottom for railroad rates, it must have assurance that it has a like measure of control over the rates of their competitors.

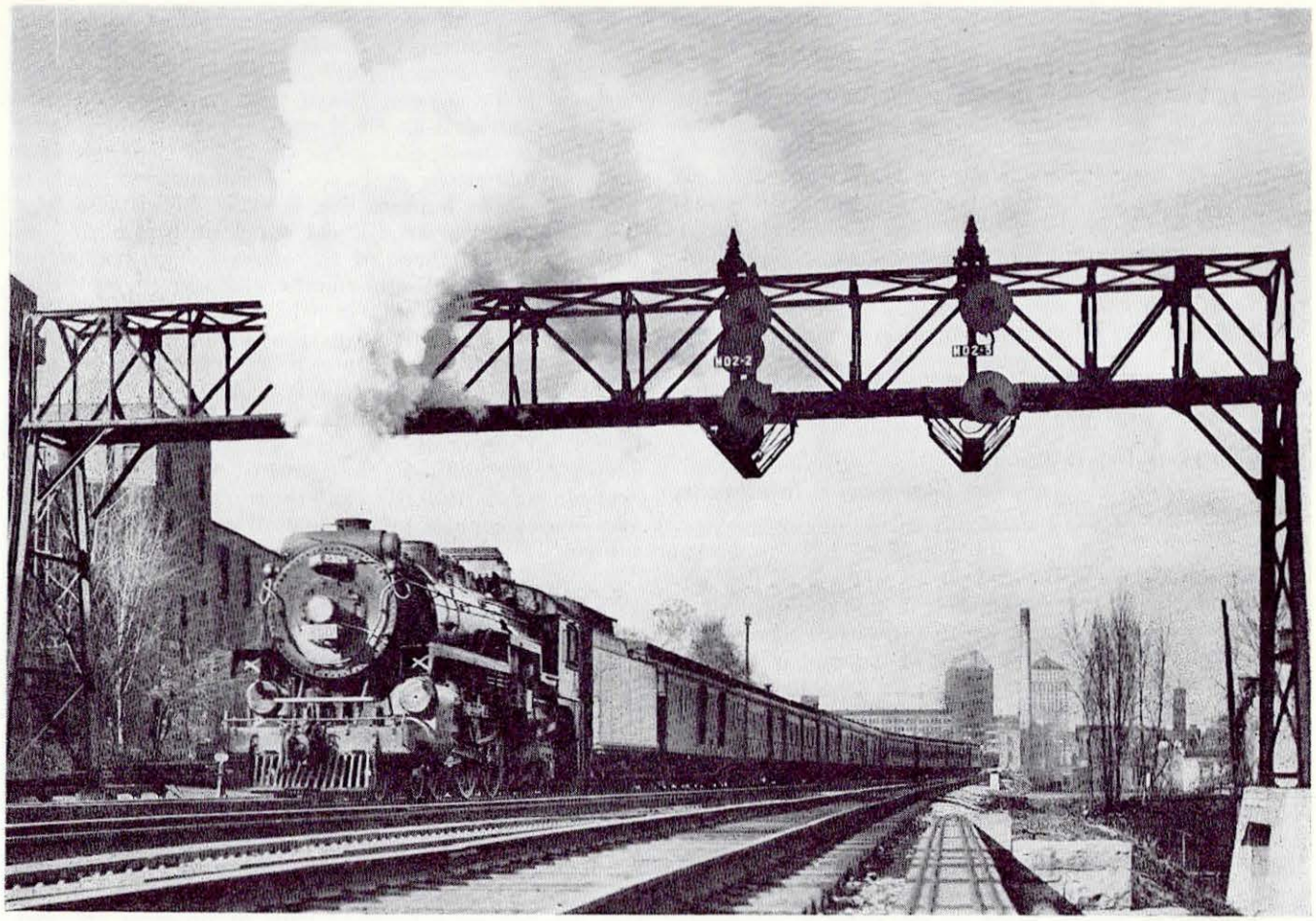
"The only important arguments in favor of separate commissions are, first, that each form of transportation has its own peculiar conditions and special problems which require specialized attention; and, second, that separate commissions could act more quickly than a larger centralized body. Both of these needs can be met by an appropriate reorganization of the Interstate Commerce Commission which will enable it to combine specialization with co-ordination, and at the same time make possible a more flexible and less unwieldy procedure for the conduct of its business.

"Nor is it enough to stop with mere regulation and the cure of evils after they arise. We have in the past [illegible] of planning and prevention. It is of course idle to attempt to plan the transportation future very far ahead. Unforeseen changes in industrial conditions and population trends are bound to occur, as well as unforeseen improvements in the art of transportation.

Constructive Planning Advocated

"The planning which should be done has a closer relation to the present. I have in mind a governmental agency, relieved from the routine of regulation, with the duty of keeping fully informed in regard to the entire transportation situation and acting as an adviser to the President and Congress. It would be equipped with a small staff of experts to study the means of transport at hand and the best use which can be made of them. It would undertake to encourage development of each form of transportation in line with its potential capacity to render service, to discourage its uneconomic use where some other agency can better meet the public needs, to check the provision of new facilities which will serve no sound economic purpose, to promote the co-operation of the various agencies in needed joint operation, and to stimulate research and experimentation in means of improving service. This agency would have authority to investigate any broad question in transportation which it finds to be in need of investigation, such as the general principles of rate making or methods of management and organization. It would undertake to bring opposing groups together for the purpose of reconciling their differences of opinion and composing controversies. It would keep in touch with all the departments of government which deal with transportation. It would report each year on the state of transportation in the nation and recommend any desirable changes in legislation.

"The thought, in short, is to keep the government in close contact with transportation, not as a mere regulatory force, but for the purpose of comprehending trends, foreseeing difficulties before they arise, bringing the component parts into co-operation with each other, and endeavoring to shape the course of government policy and action to the end of securing a national system of transportation which will keep abreast of developments in the art of transportation, meet the needs of the shipping and traveling public as they should be met, and at the same time avoid unnecessary duplication, lost motion, and waste."



A Canadian Pacific—Canadian National "Pool" Train Leaving Montreal for Quebec

Amalgamation Issue Pushed to Fore in Canada

C. P. R. head favors unification under private ownership—Others urge co-operative economies as alternative

By J. G. Lyne
Financial Editor, Railway Age

THE most interesting development in Canadian railway affairs in 1934 was the bringing to a head of the issue—Shall the two major Canadian railways, the Canadian National and the Canadian Pacific, be amalgamated? Credit for pursuing this issue until it has forced itself upon the consciousness of the Canadian people must go primarily to E. W. Beatty, chairman and president of the Canadian Pacific, who is the outspoken protagonist of amalgamation under private ownerships—with corporate entities preserved. Consolidation under government ownership—another alternative—is being favored by Hon. Wm. Euler, a prominent Liberal member of Parliament and considered to be a distinct possibility as the next Minister of Railways in the event that the Liberal party should win the impending election over the incumbent Conservatives. Neither the Prime Minister, the Rt. Hon. R. B. Bennett, nor the leader of the Liberals, the Rt. Hon. W. L. Mackenzie King, however, has declared in favor of amalgamation —quite the contrary in fact.

No "Arbitral Tribunals" So Far

Standing with the opponents of amalgamation is Judge C. P. Fullerton, chairman of trustees of the Canadian National. Judge Fullerton contends that the economies foreseen by the advocates of amalgamation are exaggerated, and that substantially as great economies can be obtained by co-operative economies by the two companies under the existing law. Failing agreement between them, on a proposed measure of economy, co-oper-

ation may be enforced by the majority vote of an "arbitral tribunal" composed of a representative of each company with the chairman of the Dominion Board of Railway Commissioners serving as the third member and chairman of the tribunal. Since Judge Fullerton resigned as chairman of the Railway Commission over a year ago to become chairman of the C. N. R. trustees, his former post on the Commission has been vacant, so no arbitral tribunal could be set up even if it were desired.

Such voluntary co-operative economies by the two railways, however, have made considerable progress—principally in connection with the pooling of passenger services—and, unless actual amalgamation occurs, they may presumably be carried much further in future. In his statement of the years' developments Mr. Beatty, among other things, said the following:

Big Capitalists Desert Private for Government Investments

"The course of our recovery from the economic catastrophe which swept over the world in 1929 and 1930 has been markedly different from that of any of the previous [illegible] depression in this country. It is nothing new for us in Canada to experience a period of depression followed by one of rapid increase in the volume of our business activities. In the past these booms have developed with great speed, and as a result those of us who refused to accept the alarmist views of the recent crisis have perhaps inclined to believe that recovery in the present case would take the same rapid course. This time, however, we seem to be experiencing a different process,—one of slow rebuilding, and, as far as I can see, one of permanent re-adjustment of our economic activities to conditions which have radically and permanently changed. What we are today experiencing is, as I see it, not the beginning of a boom, but a process of steady, and I hope permanent growth.

"It is to be regretted that the past few years have seen further increase in the debt of the Dominion, the Provinces and many municipalities. Much of our public debt has been incurred for purposes obviously legitimate as part of the ordinary government of the country, but much has resulted from experiments in the direction of governmental participation in business. Regrettable as is the loss occasioned by errors on the part of private enterprise, this type of loss is corrected by a reduction in the income and capital holdings of those who finance the enterprises. An unwise investment by a public body means a permanent charge on the taxpayers. I recommend this thought to those who believe that further expansion of governmental activities is the best method of protecting the ordinary citizen from exploitation by capitalists. In actual fact the safest policy for great capitalists is at present to buy securities issued by public bodies and to leave the chance of loss to be carried by the mass taxpayers.

Criticism of Amalgamation Invited

"Throughout the past year the matter of the country's railway problem has received an increasing amount of public attention, and I am convinced that proposals for its solution along the lines of unified management for the two great companies have made decided progress. In all directions are observable a greater willingness on the part of the public to enter upon an unprejudiced consideration of the case, and even among those classes whose interests might at first glance seem to be threatened by any such proposals, I discover a growing desire to examine their possibilities and to find out if they really are as dangerous as those who early rushed into print to attack them would appear to believe.

This is all to the good. If unified management will not stand up under the most searching criticism, obviously, it should not go forward. But the criticism should be fair and honest and it should be based upon a fairly sound understanding of railway economics and not upon personal interest or prejudice. I say nothing less than the truth when I affirm that most of the criticism that has come out so far will not stand up before any one or even two or three of the above tests. I shall not further deal with the matter here except to say that I can see no other way in which the country can put a stop to the cumulative wastage of vast sums of money and can safeguard the future of both railways while adequately preserving the property rights of the Canadian people in the Canadian National, and those of the shareholders of the Canadian Pacific. In a word this is my proposal for unified management—it is a partnership between public ownership and private ownership with the added advantage of private operation free from political control.

Hopeful of Future

"It appears to me that we can look back on 1934 with some contentment, as a year during which we found that the world was not ending, and that by industry and thrift nations and individuals could still prosper. What interests me more is that I believe we can look forward to 1935 and successive years with confidence that under Providence we shall see in them a period when Canada will revive that faith in her future which too many of us have seemed to lose, and that we shall again come to realize that all that is wanted to set this country on a forward path of progress are such simple virtues as energy, honesty, and ordinary common sense."

Negativing Mr. Beatty's proposals for railway amalgamation, but quite as optimistic as he regarding future prospects, Judge Fullerton in Ottawa last week made the assertion that Canada has the cheapest railway rates in the world and that "the Canadian National Railways are being sacrificed for the good of the country as a whole."

"Sir Henry Thornton," he continued, "once said that if the C. N. R. had the same rates for grain shipments as those in the United States, the C. N. R. would not only pay the interest on its bonded indebtedness, but would have $20,000,000 to spare. As I thought that rather a remarkable statement, I asked our economist to check it up and he found it to be the exact truth."

Foresees C. N. R. Paying Off Bonds

Mr. Fullerton said that he hoped the time would come shortly when the C. N. R. would not only meet all interest payments but also would make progress on paying off the bonded debt. Economies continued to go on; wherever possible, without impairing service, economies would be effected.

Some of the difficulties of the Canadian railways—particularly those of the Canadian National—which have given rise to the demand for economies, either by amalgamation or otherwise, come from the fact that a large part of the Dominion is still in the developmental stage during which—in all countries—railways have experienced difficulties in making both ends meet. This point of view regarding the railways of Canada was recently ably set forth in an address by S. W. Fairweather, director of the Bureau of Economics of the C. N. R.

He said, among other things, the following:

"In studying the relationship between railway development and the growth of national wealth, I chose for study, two territories the development of which, because of a lack of navigable waterways, would have been utterly impossible without the railway. The first is the territory in the United States west of the Mississippi River, the other Western Canada. Before the development of railways these territories were worth little or nothing; they could support but a small population engaged in hunting and fur trading. In the United States west of the Mississippi river the railway development bill was, roughly speaking, 10 billion dollars. Whatever doubts there may be at the present time with regard to the national wealth of the United States, a survey at the time I made it showed the national wealth of the territory in question to be 110 billion dollars. For each dollar expended in railway development there was a return of $11—not a bad return. A similar analysis of the Canadian West shows that the railway development cost to date is in the order of one billion dollars, and the national wealth development local to the territory is in the order of eight billion dollars. In comparing these figures you must, of course, take into consideration the fact that the United States had the jump on us by at least thirty years and it is significant that at equivalent stages in point of time we have responded to the stimulating influence of railways to even a somewhat greater extent than the United States. If the past can be taken as any criterion of the future it is reasonable to expect that we will ultimately reach a ratio of national development in relation to railway cost equal to theirs. Speaking broadly, and from the national standpoint, Canada's railway development has been amply justified by the resulting growth of national wealth. In that sense we have no railway problem.

Receiverships or Subsidies?

"The denial of the principle that railways shall be permitted to charge what the service will bear has resulted in the anomolous situation that wherever capital has been invested in railway expansion a portion of it has been either wiped out by receiverships or protected by governmental aid. Reverting to railway development in the territory west of the Mississippi—you might think that a development which cost $10 billions and returned $110 billions to the nation would be a pretty safe investment, nevertheless $3 billions of the capital invested was wiped out by receiverships, inherently brought about by the lack of ability of the railways to share sufficiently in the wealth which it created. This has been a universal characteristic of railways. Everywhere you examine the problem you find a great increase in wealth following the construction of railways but you also find that a considerable portion of the initial capital invested in railways has been wiped out by receiverships. The railway is not torn up; the capital is simply re-adjusted (a euphonious phrase for saying that some poor investor 'lost his shirt'), but after some thirty years of such experience, investors become a bit chary and countries with vast continental stretches awaiting railway development, were forced to find some means of overcoming this hurdle.

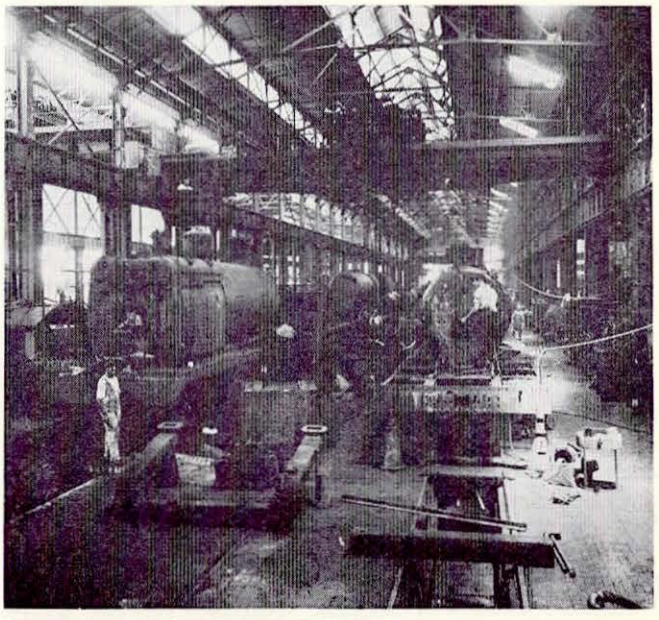
"Some means of carrying a railway through the development stage had to be found without the sacrifice of capital by the investor, hence the period of cash subsidies and of land grants, and still later the period of guarantee of securities. We, in Canada, have used all of these mediums for inducing investors, who had by bitter experience found out that early investment in railways would be dangerous, to venture their capital in the development of our country. Uncle Sam, in the capacity of the early bird, had caught the worm so to speak. I think this point is rather important, because broadly speaking while the United States secured their national development at the expense of the foreign investor to the tune, as I have intimated, of $3 billion west of the Mississippi river alone, we in Canada can make the proud, if somewhat expensive boast, that through subsidies, land grants and guarantees, the foreign investor in railway securities in Canada has been protected."

Car Loadings and Earnings Improve

Railway recovery in 1934 proceeded at a much faster pace in the Dominion than was the case south of the international boundary. Car loadings for the year were more than 14 per cent greater than in 1933, as compared with an increase of only 5.4 per cent in the United States. Gross revenues of the Canadian National for 1934 are expected to be about $16,000,000 greater than the previous year, according to a statement made by S. J. Hungerford, president. Comparative figures for 1933 and 1934 in round numbers are as follows: 1933, actual revenues, $148,520,000; expenses, $142,815,000; net operating revenue, $5,705,000. 1934, estimated revenues, $164,900,000, expenses, $152,200,000, net operating revenue, $12,700,000. The increases for 1934 over 1933 are of $16,380,000 in revenues, $9,385,000 in expenses and $6,995,000 in net operating revenue. Since interest on C. N. R. obligations in the hands of the public is about $56,000,000, the deficit after these charges will be in the neighborhood of $49,000,000.

The Canadian Pacific, in the first eleven months of the year, had gross revenues of $114,837,505, operating expenses of $93,624,559 and net operating revenue of $21,212,614. These totals were, respectively, $10,480,224, $6,883,317 and $3,596,906 ahead of the eleven months' totals for 1933. As a matter of fact, the revenues, expenses and net of the Canadian Pacific for the eleven months were each just slightly more than similar totals for the entire year 1933.

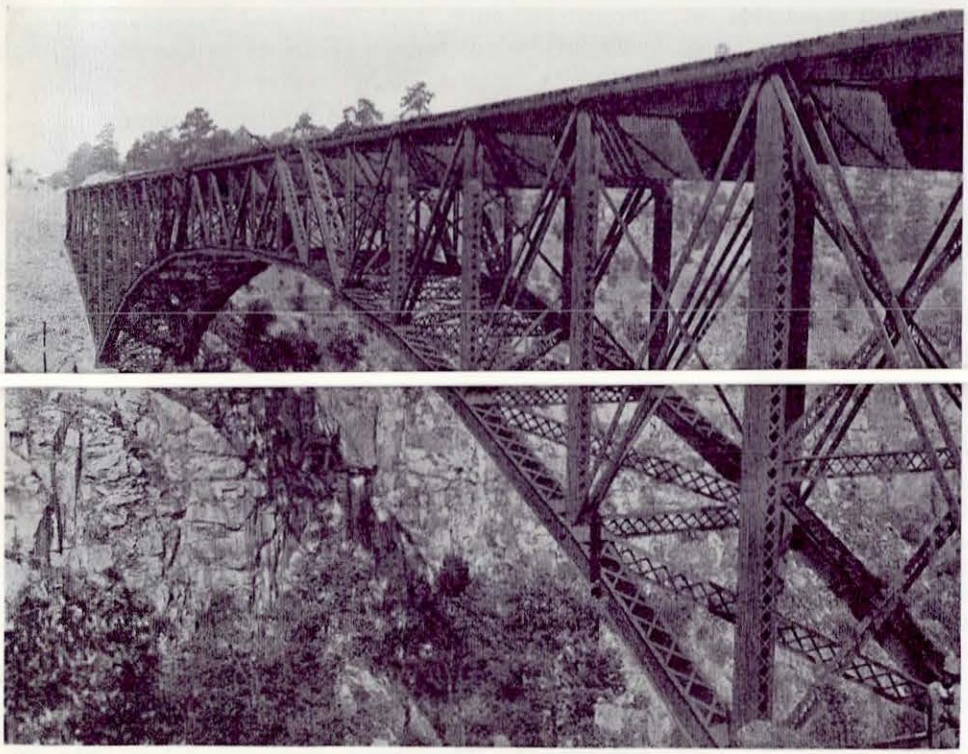
* * *



Courtesy South African Railways & Harbors

The Locomotive Erecting Section of the South African Railways Shops at Durban

Mexican Railways Returning to Prosperity



Three-Span Cantilever Bridge Over the Chico River

Increase in gross earnings and control of operating expenses bring better net results

By Nicolas Procel

Vice-President, National Railways of Mexico, Mexico, D. F.

THE first 10 months of 1934 reflect considerable improvement over the corresponding period of 1933 on the National Railways of Mexico, not only as regards the gross earnings, but also as to the operating results.

The improvement is attributable to better general performance and to better control of expenses, made possible through the budget system now in effect and through careful observation and study of cost statistics. Business in general picked up considerably in Mexico during 1934, the revival being reflected in a steady month-by-month increase in railroad earnings. As anticipated, mining activities showed a distinct upward trend, with all classes of ores and fuel showing increased tonnage. These increases prevailed despite the fact that it was a presidential election year, which, as in other countries, has the effect of retarding investment.

New appointments in the cabinet of the incoming president resulted in changes in the directorate of the National Railways of Mexico. Narcisco Bassols, secretary of finance, was appointed president of the board of directors of the railway, and R. E. Calles, secretary of communications and public works, was appointed vice-president.

Gross earnings increased from $77,225,192 to $97,460,889 in the first 10 months of 1934, as compared with the same period of 1933; freight earnings increased from $53,147,816 to $70,500,251; passenger earnings rose from $14,209,816 to $17,414,698, and express earnings from $7,469,249 to $9,035,169. Although miscellaneous earnings declined from $2,398,309 to $510,770, the total increase in gross earnings amounted to $20,235,696. The total expenses increased only from $70,813,178 to $74,044,209, or 4.56 per cent, while the increase in gross earnings was 26.2 per cent. Net earnings increased $23,416,679, as compared with $6,412,013 in the previous period. While the trend of gross earnings shows a steady increase in 1934, operating expenses increased but slightly, a result made possible through statistical observation and the budget control system.

Statistical Results

The following statistical data refer only to the National Railway System and to the first 10 months of 1934.

They reveal the improvement in performance over the similar period of the previous year.

Total locomotive kilometers, including yard and work train, increased from 23,569,730 to 26,809,427; freight train kilometers increased from 7,214,472 to 9,278,546 and passenger train kilometers from 7,046,027 to 7,536,337, while mixed train kilometers decreased from 4,483,285 to 4,296,720, and work train kilometers increased 44,286, a total increase of 2,412,105 train kilometers, or 12.8 per cent. Passenger car kilometers increased from 59,196,220 to 65,066,923; loaded freight car kilometers rose from 126,223,081 to 155,149,184, and empty freight car kilometers increased from 61,286,589 to 75,369,143, a total increase of 43,008,657 freight car kilometers, or 22.9 per cent. Car-days increased from 4,409,802 to 4,667,268, or 5.8 per cent. The total number of cars loaded, including loads received from foreign lines, increased from 287,622 to 351,497, or 22.2 per cent.

It will be noted that while car-days increased only 5.8 per cent, net ton-kilometers increased 29.6 per cent, showing that a heavier traffic was handled with fewer cars, resulting in part from an increase from 23 to 24 net tons loaded per car. Utilization of motive power by the transportation department increased from 76.6 per cent in 1933 to 77.8 per cent in 1934, while total gross freight ton-kilometers increased 34.5 per cent and net ton-kilometers increased 38.3 per cent. Net tons per train-kilometer increased from 321 to 345, or 7.5 per cent, while gross tons increased from 738 to 772, or 4.6 per cent. Gross ton-kilometers per train hour increased from 17,262 to 18,000, equivalent to 4.3 per cent.

Direct transportation freight train costs dropped from $1.10 to $1.03 per 1,000 gross ton-kilometers. These costs include only fuel and train and enginemen's salaries. The average cost per freight train-kilometer decreased from $0.68 to $0.66 in 1934, brought about by greater gross tonnage handled per train-kilometer, with resulting lower fuel consumption and wage cost per 1,000 gross ton-kilometers. Freight train speed was not a contributing factor in these lower unit costs, as it decreased from 23.7 to 23.3 kilometers per hour. However, a slight decrease in the price of fuel was of assistance.

The total number of liters of fuel oil consumed by freight trains increased from 221,005,317 in 1933 to 280,426,228 in 1934, or 26.8 per cent, while gross ton-kilometers increased from 5,323,685,560 to 7,162,094,654, or 34.5 per cent, resulting in a decrease from 41.51 to 39.15 liters in consumption per 1,000 gross ton-kilometers. The average number of locomotives available for service, including those stored decreased by 17, and serviceable locomotives stored decreased by 59. Locomotives waiting repairs or disposition increased by 31, and those undergoing repairs decreased 2. The percentage of serviceable locomotives to the total decreased from 65.7 to 64.8. Locomotive repair costs (labor) per 1,000 kilometers run decreased from $235.45 to $216.28, while material costs increased from $124.67 to $125.63, a combined net decrease from $360.12 to $341.91. Freight car repair costs (labor) increased from $10.77 to $12.98, and material costs increased from $13.54 to $18.54, with a total increase from $24.31 to $31.52 per 1,000 kilometers run. Passenger car repairs (labor) increased from $15.91 to $15.92, while material costs decreased from $32.02 to $29.89 per 1,000 kilometers run, resulting in a combined decrease from $47.92 to $45.81.

Although passenger earnings increased, passenger traffic is still by no means normal, principally due to ever-increasing highway competition. However, freight earnings did reach the normal level, and the continuous upward trend indicates that Mexico is definitely emerging from the slump which reached its bottom during 1932 and the early part of 1933. It was not until the middle of the latter year that the trend took a favorable direction. The freight traffic situation is shown in the following table:

Merchandise	Tons 1933	Tons 1934	Increase	Decrease
Beans	67,871	97,214	29,343	
Beer	33,641	49,852	16,211	
Bullion	115,995	160,371	44,376	
Cotton	58,608	73,379	14,771	
Coffee	46,624	47,386	762	
Coal	70,029	100,909	30,880	
Cement	98,171	138,032	39,861	
Coke	127,157	202,920	75,763	
Construction steel	39,358	49,077	9,719	
Cattle	99,557	108,709	9,152	
Corn	366,630	461,551	94,921	
Charcoal	124,913	137,936	13,023	
Fuel oil	224,228	282,932	58,704	
Fruits and vegetables	257,512	211,677		45,835
Flour	79,942	86,172	6,230	
Gasoline	134,602	174,514	39,912	
Lumber	183,322	284,646	101,324	
Lard	35,356	38,766	3,410	
Machinery	23,300	23,596	296	
Minerals (ores)	511,440	766,708	255,259	
Miscellaneous	1,772,976	2,274,670	501,694	
Pulque (alcohol beverage)	76,579	83,889	7,310	
Rice	31,888	40,230	8,342	
Refined oil and by-products	126,914	147,851	20,937	
Sugar	138,905	112,795		26,110
Salt	60,168	58,825		1,343
Tobacco	7,491	8,192	701	
Wheat	188,877	208,158	19,281	
Wine and liquors	8,534	10,118	1,584	
	5,110,597	6,441,075	1,403,766	73,288
Net Increase		1,330,478		

The Colonia Hospital for Mexican Railwaymen Will Be the Finest in Latin America

The net increase of 1,330,478 tons was widespread, miscellaneous shipments having shown the greatest increase, followed by ore, lumber and corn. However, as traffic movements are better represented in ton-kilometers, it may be added that the increase was from 2,887,347,000 in 1933 to 3,741,950,000 in 1934, an excess of 854,603,000 net ton-kilometers, or 29.6 per cent (freight and mixed service).

Additions and Betterments

Expenditures for additions and betterments totaling $3,145,386 were made on the National Lines during the first 10 months of 1934, the largest item being $878,412, for the construction of the Colonia Railwaymen's Hospital which is expected to be completed within three months and which will be the most up-to-date railroad hospital in Latin America. The second largest expenditure was $782,552 for the replacement of 56-lb., 60-lb. and 75-lb. rail, with 80-lb. on the Torreon and Guadalajara divisions; the construction of new yard tracks at different stations at a cost of $380,216; and the acquisition of machinery and apparatus for shops at Aguascali-

192.

The construction of laborers' quarters required the expenditure of $88,607, of a total of $300,000 authorized for this purpose. Other miscellaneous expenditures for additions and betterments amounted to $444,413.

Several New Projects Are Planned

Among expenditures planned in the future, studies and preliminary work have already been made for the installation of centralized traffic control between Mexico City and Lecheria, a distance of 22 kilometers, with a view of operating single instead of double track, which is expected to bring a more economical and efficient movement of trains. The approximate cost is half a million pesos. Preliminary work has also been started on the installation of a hump yard, equipped with car retarders, in Mexico City in order to centralize the classification of all freight at one point instead of at different yards, as is now being done. The total cost of this installation will be in the neighborhood of a million and a half pesos.

International Traffic

The average number of loaded cars interchanged monthly by the National Railways of Mexico with American roads at the border during 1934 was as follows:

	Imports		Exports	
	1933	1934	1933	1934
Laredo	304	442	132	338
El Paso	102	154	27	150
Eagle Pass	47	66	36	116
Brownsville	4	27	10	13
Total	457	689	205	617
			Water Ports	
Tampico	72	100	544	792
Veracruz	259	201	538	425
Manzanillo	32	47	3	5
Total	363	348	1,085	1,222

It will be noted that, while imports into Mexico increased 50 per cent, exports increased 200 per cent, because the manufacture of Mexican goods is reaching a higher state of perfection, apart from the fact that the high rate of exchange prevailing, 3 pesos, 60 cents per dollar, makes it advantageous for American firms to buy in Mexico. The National Railways' equipment is not, at the present time, entering American territory, cars being transferred at the border.

The general results for the year were very encouraging. Although the increase in traffic naturally brought about better general results, careful and watchful operation of trains was also necessary, together with a better and more economical administration, which brought favorable net returns and makes the outlook much better for the coming years.

* * *

On the Chicago & Eastern Illinois near Seventy-ninth Street, Chicago

Narrow Market
Movement Marks

FINANCIAL DOLDRUMS OF 1934

By J. G. Lyne
Financial Editor,
Railway Age

Net increase in loans from R.F.C. under forty millions—Some revival in private financing and dividends

THE year 1934 was one of marking time—at a funeral pace—in railroad finance. The market situation was relatively little worse at the end of the year than it was at the beginning. Nevertheless, if a patient is "low" the persistence of that state may wear him out even if no sudden malignancy of his disease develops. Continued doses of stimulant in the way of R. F. C. loans kept the sufferer alive and reasonably hopeful of eventual recovery during the period—while therapy in the way of legislative relief was postponed for yet another year.

Operating revenues were $155,000,000 greater than in 1933, but this increase was more than offset by increased expenses so that the net deficit after fixed charges was approximately $35,000,000, as compared with $6,000,000 in 1933.

Market prices of both stocks and bonds fluctuated within very narrow limits during the year, with the first half having decidedly the better of it. Stock prices, in the *Railway Age's* index of 20 leading stocks, had a high of 49.57 in the first week in February, and the low point, 33.14, came in the third week in September. The bond index varied between a high of 80.26, reached during the last week in April, and a low of 69.58 at the beginning of the year. The *Railway Age* index of bond prices ranged throughout most of the year at prices considerably above those of 1933, while stock prices in 1934 ran above those of the preceding period in the first half of the year and below them thereafter. The stock price index ended the year approximately 4 points below that at the beginning, while bonds were 5½ points higher when the year closed than they were when it began. The trend of stock and bond prices, based on the *Railway Age* indices, during the last decade are shown graphically in Chart A, while the detailed fluctuations during the past year are set forth in Chart B.

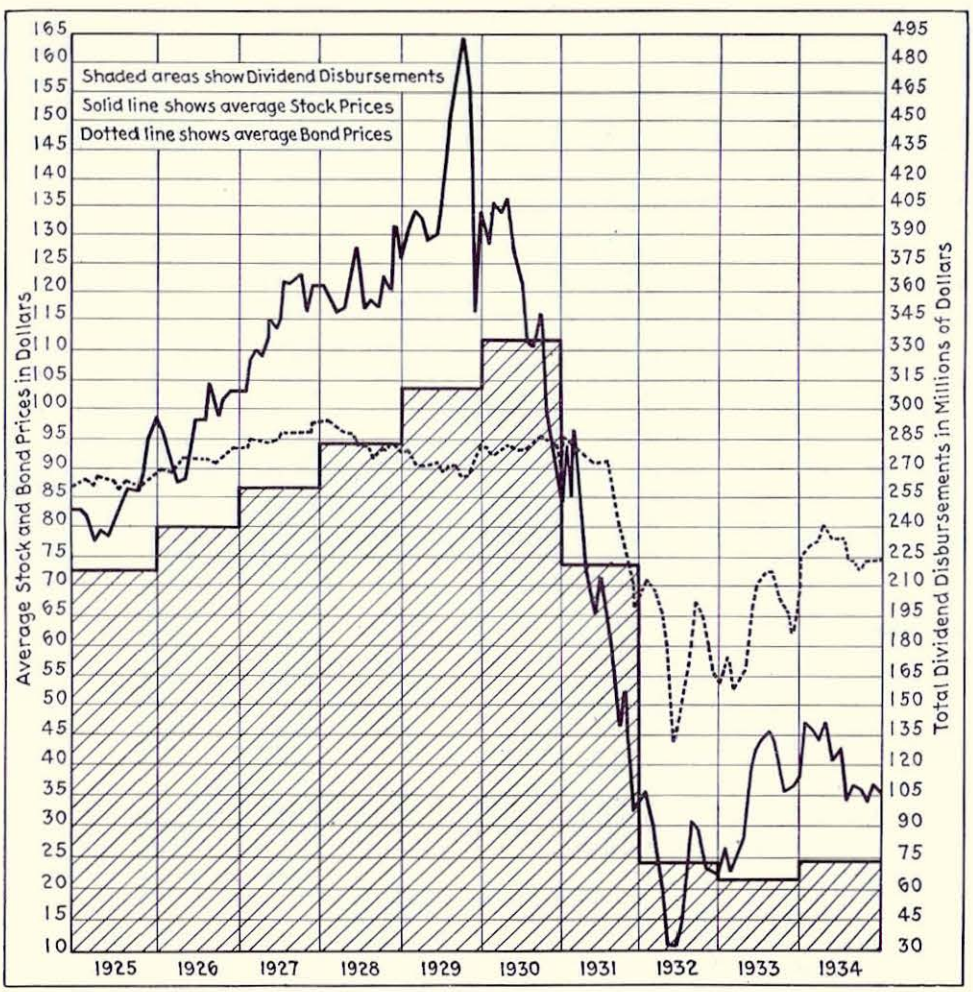


Chart A—Ten-Year Average Prices of Stocks and Bonds of Twenty Leading Railroads, With Dividend Disbursements on Same Relative Scale

1934 Dividends Estimated

At this time a year ago the writer ventured a guess that 1934 would show an amelioration of the railways' financial plight. That prediction did not work out very brilliantly, because of the failure of traffic to hold its gains in the second half of the year, because Congress failed to act with regard to competing transportation and because of the increase in wages and the advance in prices of materials under the N.R.A. regime. Natural economic forces are given so little opportunity to

work as far as the railroads are concerned that it is difficult to predict with any assurance concerning their future unless one knows of all the political forces which will be brought to bear—and what the resultant of the

Table I—Comparison of Dividends and Taxes, 1911 to 1933

Year Ended June 30	Dividends*	Proportion of Net Income Paid in Dividends	Taxes*
1911	$397,068,724	81	$98,626,848
1912	339,964,855	85	109,445,407
1913	322,300,406	66	118,386,859
1914	376,098,785	108	135,572,579
1915	259,809,520	82	133,276,330
1916	281,936,371	47	145,517,034
Year Ended December 31			
1916	306,176,937	47	157,113,372
1917	320,395,779	53	213,920,095
1918	275,336,547	71	223,175,379
1919	278,516,908	62.5	232,601,396
1920	271,731,669	63	272,061,453
1921	298,511,328	95	275,875,990
1922	271,573,751	73	301,034,923
1923	296,127,048	53	331,915,459
1924	320,429,767	57	340,336,686
1925	342,020,885	49	358,516,046
1926	399,243,963	49	388,922,856
1927	411,581,093	61	376,110,250
1928	[illegible]	[illegible]	[illegible]
1929	490,125,673	55	[illegible]
1930	497,024,912	95	348,553,953
1931	330,150,873	245	303,528,099
1932	92,354,322	166	275,135,399
1933	95,725,783	116	249,623,190

* Not including switching and terminal companies.

meeting of those forces will be. The future depends entirely on the decision in the proposed increase in freight rates, the extent to which railway competitors are brought under regulation, whether railway labor expenses can be reduced or whether they are to be materially increased, and—particularly important—the trend of general business and traffic during the year. If developments with regard to most of these questions are favorable, then the railways will have a comparatively good year in 1935. If, by and large, the prospective favorable developments fail to materialize, the outcome will be unfortunate indeed.

New Financing

There was a limited revival in new financing during the past year. The Pennsylvania, the New York Central,

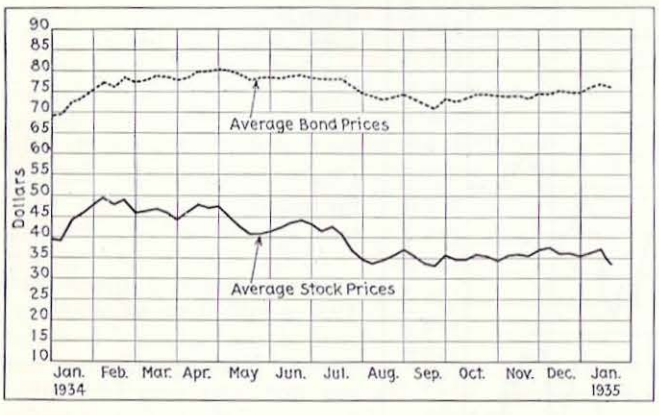


Chart B—Fluctuations in the Average Price of Twenty Leading Railroad Stocks and Twenty Bonds in 1934

the Baltimore & Ohio and the Lackawanna sold securities to the public, and there was a revival also in the distribution of equipment trust certificates—most of which were sold by the railroads to the Public Works Administration, which transferred them to the Reconstruction Finance Corporation, which in turn sold them to the bankers for distribution through ordinary channels. These issues are described in an accompanying table. The bankers offering railway securities for sale did so somewhat charily with the new securities act in mind, remaining in the background as much as possible. In one case bonds were offered to the public by the railroad directly, acting under the "advice" of the bankers who, however, received a fee for their services.

R. F. C. Loans

Loans made to railroads by the Reconstruction Finance Corporation during the year totaled $53,189,014,

Table II—R. F. C. Loans to Railroads on December 31, 1934

	Authorized	Disbursed	Repaid
Aberdeen & Rockfish	$ 127,000	$ 127,000	$ 9,000
Alabama, Tennessee & Northern	275,000	275,000	.....
Alton	2,500,000	2,500,000	.....
Ann Arbor (Receivers)	634,757	634,757	.....
Ashley, Drew & Northern	400,000	400,000	.....
Baltimore & Ohio	72,125,000	72,110,400	12,144,900 14,000#
Birmingham & Southeastern	41,300	41,300	.....
Boston & Maine	7,569,437	7,569,437	.....
Buffalo-Union, Carolina	53,960	.....	53,960#
Carlton & Coast	549,000	535,800	1,206 13,200#
[illegible]	[illegible]	[illegible]	[illegible]
Central of New Jersey	[illegible]	[illegible]	[illegible] 35,702#
Chicago & Eastern Illinois	5,916,500	5,916,500	155,632
Chicago & NorthWestern	46,589,133	46,588,133	3,513,000 1,000#
Chicago & Great Western	1,289,000	1,289,000	638
Chicago, Milwaukee, St. Paul & Pac.	12,000,000	10,700,000	538
Chicago, North Shore & Milwaukee	1,150,000	1,150,000	.....
Chicago, Rock Island & Pacific	13,718,700	13,718,700	363,433
Cincinnati Union Terminal	10,398,925	8,300,000	8,300,000 2,098,925#
Columbus & Greenville	60,000	.....	60,000#
Copper Range	53,500	53,500	.....
Denver & Rio Grande Western	8,300,000	8,081,000	500,000 219,000#
Denver & Salt Lake Western	3,182,150	3,182,150	.....
Erie	16,582,000	14,471,000	4,689
Eureka Nevada	3,000	.....	3,000#
Florida East Coast (Receivers)	717,075	627,075	90,000#
Ft. Smith & Western (Receivers)	227,434	227,434	.....
Fredericksburg & Northern	15,000	.....	15,000 #
Gainesville Midland (Receivers)	10,539	.....	10,539#
Galveston, Houston & Henderson	1,061,000	1,061,000	.....
Georgia & Florida (Receivers)	354,721	354,721	.....
Great Northern	6,000,000	6,000,000	6,000,000
Greene County	13,915	13,915	915
Gulf, Mobile & Northern	520,000	520,000	520,000
Illinois Central	17,863,000	17,837,333	75,000 16,667#
Lehigh Valley	9,500,000	8,500,000	1,000,000#
Litchfield & Madison	800,000	800,000	.....
Maine Central	2,550,000	2,550,000	84,811
Maryland & Pennsylvania	100,000	100,000	.....
Meridian & Bigbee River (Trustee)	1,488,504	500,000	744,252#
Minneapolis, St. P. & St. Ste. Marie	6,843,082	6,843,082	512,715
Mississippi Export	100,000	100,000	.....
Missouri Pacific	23,134,800	23,134,800	.....
Missouri Southern	99,200	99,200	.....
Mobile & Ohio	785,000	785,000	785,000
Mobile & Ohio (Receivers)	1,070,599	1,070,599	193,000
Murfreesboro-Nashville	25,000	25,000	.....
New York Central	27,499,000	27,499,000	.....
New York, Chicago & St. Louis	18,200,000	18,200,000	2,688,413
New York, New Haven & Hartford	7,700,000	7,699,779	221#
Pennsylvania	29,500,000	28,900,000	28,900,000 600,000#
Pere Marquette	3,000,000	3,000,000	.....
Pioneer and Fayette	10,000	10,000	.....
Pittsburgh & West Va	4,475,207	3,975,207	.....
Puget Sound & Cascade	300,000	300,000	.....
St. Louis-San Francisco	7,995,175	7,995,175	2,805,175
St. Louis-Southwestern	18,790,000	18,672,250	790,000 117,750#
Salt Lake & Utah (Receivers)	200,000	200,000	.....
Sand Springs	162,600	162,600	.....
Southern Pacific	23,200,000	22,000,000	.....
Southern	14,751,000	14,751,000	246,000
Sumter Valley	100,000	100,000	8,640
Tennessee Central	147,700	147,700	.....
Texas, Okla. & Eastern	108,740	.....	108,740#
Texas & Pacific	700,000	700,000	100,000
Texas South-Eastern	30,000	30,000	5,000
Tuckerton	45,000	39,000	81 6,000#
Wabash Railway (Receivers)	15,731,583	15,731,583	.....
Western Pacific	4,366,000	4,366,000	1,303,000
Wichita Falls & Southern	400,000	400,000	.....
Wrightsville & Tennille	22,525	22,525	22,525
	$457,856,080	$447,283,272	$70,727,837

# Denotes amount cancelled or withdrawn instead of repayment. (Total cancellations, $5,208,556.)

which was less than half the sum advanced to them in 1933. Total loans to the railroads by this agency at the end of 1934 were $447,283,272 of which $70,727,837 had been repaid, leaving a net indebtedness by the

Table III—Major Securities Issues Authorized in 1934

Issue	Maturity	Amount	Int. Rate	Sold to Banker Price	Sold to Banker % Cost	Offered to Public Price	Offered to Public Yield	Bankers
Baltimore & Ohio, Secured Notes	1939	$50,000,000*	4½	99	.....	100	.....	Kuhn, Loeb & Co.; Speyer & Co. Brown Harriman & Co., Inc.
Bangor & Aroostook	1951	2,000,000	4	97½	4.35	100	4.	Brown, Harriman & Co., Inc.; Lee Higginson Corp.
Canadian National, 16-year Guaranteed	....	20,500,000	3	98¾	3.1	.....	.....	Syndicate of Canadian Bankers
Canadian Pacific, 14-yr. Collateral Trust	....	12,000,000	4	.....	.....	97¾	4.2	Canadian Bankers
Chicago & Western Indiana, Series A	1962	6,100,000	5½	.....	.....	102½	5.32	Brown Harriman & Co., Inc.; Ed. B.
	1962	1,658,000	5½	.....	.....	102½	5.32	Smith & Co.; Kidder, Peabody & Co.; Field, Glore & Co.; Lee Higginson Corp.
Delaware, Lackawanna & Western, N. Y. L. & W. 1st and Ref. mtg., Series A, 15 yr.	....	13,639,000	4	91½	4.49	.....	.....	†
New York Central, 10-year secured bonds	....	59,911,100	6	.....	.....	.....	.....	Sold to stockholders
Pennsylvania, Series E	1984	50,000,000	4¼	95	4½	97½	4.37	Kuhn, Loeb & Co.
Pennsylvania (Connecting Ry.	....	934,000	4	98.18	4.14	.....	.....	Ed. B. Smith & Co.
" (Nor. Central)	....	1,200,000	4½	100.375	4.48	.....	.....	Kuhn, Loeb & Co.
" (Delaware R.R.)	....	750,000	4	94.25	4.28	.....	.....	Kuhn, Loeb & Co.
" (C. & P.)	....	3,597,000	4½	99.75	4.153	.....	.....	Kuhn, Loeb & Co.
" (P. B. & W.)	....	12,929,000	4½	99.50	4.526	.....	.....	Kuhn, Loeb & Co.
" (P. O. & D.)	....	3,943,000	4½	98.50	4.578	.....	.....	Kuhn, Loeb & Co.
" (Connecting Ry.)	....	1,217,000	4	101.50	3.9	.....	.....	Ed. B. Smith & Co.

*Approximately $13,500,000 of the Issue Purchased by R. F. C. at 99.
†Bankers acted as advisers rather than agents of company in sale of issue.

Typical Equipment Trust Issues Sold to Public

Road	Maturity	Amount	Int. Rate	Sold to Banker Price	Sold to Banker % Cost	Offered to Public Price	Offered to Public Yield	Offered by
Chesapeake & Ohio	1936-49	$13,538,000	4	(1)	.....	.....	1.5 to 3.7	Halsey, Stuart & Co., Inc., and 17 other Banking Houses
Northern Pacific	1936-43	1,220,000	4	(1)	.....	100¼	.....	Stroud & Co. Inc.; E. H. Rollins & Sons,
						101½	.....	Inc.
Lehigh & New England, Series H	1935-44	1,204,000	4	(1)	.....	99½	1.8-1.67	Stroud & Co., Inc.; E. H. Rollins & Sons, Ed. Lowber Stokes & Co.
Chesapeake & Ohio	1936-40	1,200,000	4	(1)	.....	100½	.....	Stroud & Co., Inc.; Graham, Parsons & Co.; Sadler & Co.
Southern, Series CC	....	2,706,000	4½	.....	.....	.....	3.8-4.2	Freeman & Co.

(1)Purchased by Bankers from R. F. C.

Table IV—Railway Securities Sold to Public in 1916 and 1920 to 1934

Year	Bonds	Notes	Stock	Total R.R. financing	Total all financing	Per Cent R.R. to total
1916	$229,000,000	$126,000,000	$16,000,000	$371,000,000	$1,864,000,000	19.90
1920	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.12
1921	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.64
1922	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.22
1923	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.04
1924	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.46
1925	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.63
1926	241,954,000	172,477,000	41,577,200	456,008,200	5,746,354,000	7.94
1927	686,939,500	89,184,600	210,596,900	986,721,000	7,830,641,000	12.61
1928	525,719,000	79,911,000	187,369,100	792,999,100	8,473,880,000	9.4
1929	418,984,000	180,322,000	275,269,240	874,575,240	11,007,170,000	7.9
1930	800,694,000	142,168,000	63,805,600	1,006,667,600	5,920,498,000	17.0
1931	453,824,000	105,209,000	.....	559,033,000	2,730,082,000	20.5
1932	11,827,000	13,125,000	.....	24,952,000	684,806,000	3.6
1933	12,000,000	.....	.....	12,000,000	335,812,000	3.6
1934*	147,974,000	56,310,000	.....	204,284,000	535,807,620	38.1

*11 Months Totals as compiled by Dow Jones & Co.

Table V—Summary of Railroad Receiverships and Foreclosure Sales, 1876 to 1934

	Roads Placed in Receivership			Summary of Foreclosure Sales				Roads Placed in Receivership			Summary of Foreclosure Sale		
Year	Number of roads	Miles	Bonds and stocks	Number of roads	Miles	Bonds and stocks	Year	Number of roads	Miles	Bonds and stocks	Number of roads	Miles	Bonds and stocks
1876...	42	6,662	$467,000,000	30	3,840	$217,848,000	1906...	6	204	$55,042,000	8	262	$10,400,000
1877...	38	3,637	220,294,000	54	3,875	198,984,000	1907...	7	317	13,585,000	6	114	13,777,000
1878...	27	2,320	92,385,000	48	3,906	311,631,000	1908...	24	8,009	596,359,000	3	138	2,547,000
1879...	12	1,102	39,367,000	65	4,909	243,288,000	1909...	5	859	78,095,000	12	2,629	250,033,000
1880...	13	885	140,265,000	31	3,775	263,882,000	1910...	7	735	51,427,500	17	1,100	93,660,109
1881...	5	110	3,742,000	29	2,617	137,923,000	1911...	5	2,606	210,606,882	13	1,386	40,741,543
1882...	12	912	39,074,000	16	867	65,426,000	1912...	13	3,784	182,112,497	12	661	25,910,990
1883...	11	1,990	108,470,000	18	1,354	47,100,000	1913...	17	9,020	477,780,820	6	1,159	86,163,850
1884...	37	11,038	714,755,000	15	710	23,504,000	1914...	22	4,222	199,571,446	9	1,470	83,189,500
1885...	44	8,836	385,460,000	22	3,156	278,394,000	1915...	12	20,143	1,070,808,628	11	3,914	285,258,782
1886...	13	1,799	70,346,000	45	7,687	374,109,000	1916...	9	4,439	208,159,689	26	8,355	703,444,855
1887...	9	1,046	90,318,000	31	5,478	328,181,000	1917...	19	2,486	61,169,962	20	10,963	557,846,348
1888...	22	3,270	186,814,000	19	1,596	64,555,000	1918...	8	3,519	242,090,800	11	763	24,735,187
1889...	22	3,803	99,664,000	25	2,930	137,815,000	1919...	7	244	11,886,779	8	459	15,479,587
1890...	26	2,963	105,007,000	29	3,825	182,495,000	1920...	10	541	21,620,150	7	380	7,676,200
1891...	26	2,159	84,479,000	21	3,223	169,069,000	1921...	14	1,744	63,872,113	11	4,173	306,123,942
1892...	36	10,508	357,692,000	28	1,922	95,898,000	1922...	12	4,330	329,114,860	15	6,151	299,491,646
1893...	74	29,340	1,781,046,000	25	1,613	79,924,000	1923...	10	2,218	87,913,581	8	637	14,622,900
1894...	38	7,025	395,791,000	42	5,643	318,999,000	1924...	11	920	30,223,372	14	3,992	269,251,082
1895...	31	4,089	369,075,000	52	12,831	761,791,000	1925...	6	11,368	680,422,080	6	638	9,965,000
1896...	34	5,441	275,597,000	58	13,730	1,150,377,000	1926...	6	88	2,821,400	12	12,852	626,662,708
1897...	18	1,537	92,909,000	42	6,675	517,680,000	1927...	6	924	45,236,674	5	142	4,254,000
1898...	18	2,069	138,701,000	47	6,054	252,910,000	1928...	1	19	529,000	4	209	6,393,250
1899...	10	1,019	52,285,000	32	4,294	267,534,000	1929...	3	634	30,981,391	5	562	20,715,065
1900...	16	1,165	78,234,000	24	3,477	190,374,000	1930...	4	4,752	277,323,994	2	1,048	124,668,500
1901...	4	73	1,627,000	17	1,139	85,808,000	1931...	19	5,195	432,151,526	2	102	993,860
1902...	5	278	5,835,000	20	693	39,788,000	1932...	13	11,817	626,577,314	8	394	8,575,178
1903...	9	229	18,823,000	13	555	15,885,000	1933...	18	21,222	1,229,678,183	2	298	16,133,000
1904...	8	744	36,069,000	13	524	28,266,000	1934...	1	81	460,000	2	40	1,598,600
1905...	10	3,593	176,321,000	6	679	20,307,000							

railroads of $376,555,435—a net increase of only $39,475,813 during the year. Of R.F.C. loans to railroads approved by the Interstate Commerce Commission during the year ended October 31, almost 80 per cent represented sums advanced to meet maturing obligations, leaving a comparatively small proportion for meeting interest and tax payments. R.F.C. loans authorized, disbursed and repaid by individual carriers as of December 31, 1934, are shown in an accompanying table.

Table VI—Receivership Established in 1934

Name of Road	Mileage	Funded Debt Outstanding	Capital Stock Outstanding
Northwestern Railroad Company of South Carolina	81	$360,000	$100,000

Under the law as it stands at this writing, the lending life of the R.F.C. will end on January 31. It is proposed, however, to seek legislation in Congress to extend it for a further two years.

Government Loans Amply Secured

The R.F.C. in its annual report to Congress stated that it held collateral of an aggregate market or appraised value of over $600,000,000 securing its railroad loans. A total of $51,760,227 has been loaned to roads now in receivership. On eleven creditor roads on the basis of present market values there is a deficiency of collateral of approximately $17,000,000, but the corporation estimates that the securities it holds, or will secure under reorganization, will be worth at least the value of these loans. The corporation wishes to make some further loans to railroads and "probably some limited guarantees" which will "help the railroads very materially in reorganizations and consolidations." One plan which it has in mind, which may or may not be approved by Congress, is to purchase railway securities which are priced low in the market either for its own account or for individual railways in order to reduce fixed charges.

R. C. C. Collects $12,658,038

The loans outstanding by the Railroad Credit Corporation at the end of the year totaled $54,686,490 as compared with $67,344,528 at the end of 1933. Roads in the hands of receivers or trustees at the end of the year were indebted to the R.C.C. as follows: A. C. & Y., $221,015; C. of Ga., $1,498,885; C. & E. I., $1,969,061; C. I. & L., $1,680,777; I.-G. N., $698,027; Mo. P., $3,560,372; M. & O., $695,050; St. L. S. F., $3,613,183.

Loans by the Public Works Administration are in an entirely different category from those of the Reconstruction Finance Corporation and the Railroad Credit Corporation in that they are no measure of "distress" conditions, but represent improvements to railroad plant and rolling stock which would normally be financed through private channels. The fact that several issues of securities given by the railroads in payment to the P.W.A. have subsequently found their way into private hands at good prices is sufficient evidence of this condition. P.W.A. loan "allotments" to railroads at the end of 1934 totaled $193,276,500, of which $146,250,000 had been disbursed. These loans are shown in detail in an article elsewhere in this issue.

Table VII—Foreclosure Sales in 1934

Name of Road	Mileage	Funded Debt Outstanding	Capital Stock Outstanding
Gainesville & Northwestern	36	None	$750,000
Wildwood & Delaware Bay Short Line	4	$470,600	378,000
Total two companies	40	$470,600	[$1,128,000

Total government loans to the railroads still remain just about half those made at the end of federal control, all but a small proportion of which were repaid with interest.

Dividend Changes

As shown in Chart A, the dividend disbursements of the roads whose securities are used in the *Railway Age* indices of stock and bond prices rose slightly—largely by the increased payments of one carrier. By and large, however, there was little change in the dividend situation from the extreme low point of the preceding year. Among the dividend changes noted during the year were the following:

The Atchison, Topeka & Santa Fe declared a $2 dividend on its common stock to holders of record of July 31. This dividend, which was paid out of surplus, was the first paid by the Santa Fe since June, 1932, when $1 was paid.

The Atlantic Coast Line directors declared a dividend of $2.50 on the 5 per cent preferred stock of this company, payable to holders of record of October 24. Payment of 2 per cent on the company's certificates of indebtedness was also provided. The last previous disbursements on these issues were made in May, 1932.

The stock of the Bangor & Aroostook was placed on a 5 per cent annual basis in January, compared with 4 per cent obtaining previously.

The directors of the Pennsylvania declared dividends of 1 per cent in January and June. In 1933 only one such dividend was declared.

The Norfolk & Western paid a 2 per cent extra dividend on its common stock in January, in addition to its regular quarterly distribution of the same amount.

The Louisvile & Nashville resumed dividends on its common stock by the payment of $1.50 in February—its first payment in a year.

The Reading in July increased the quarterly dividend on its common stock from 25 cents to 50 cents.

Table VIII—Mileage in the Hands of Receivers or Trustees

(Figures to 1933, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1933. Figures for 1934 Compiled by *Railway Age*.)

	Miles of road operated by receivers or trustees	Net change during the year in miles	Number of roads in charge of receivers or trustees
June 30, 1894	40,819	.....	192
1895	37,856	—2,963	169
1896	30,476	—7,380	151
1897	18,862	—11,614	128
1898	12,745	—6,117	94
1899	9,853	—2,892	71
1900	4,178	—5,675	52
1901	2,497	—1,681	45
1902	1,475	—1,022	27
1903	1,185	—290	27
1904	1,323	+138	28
1905	796	—527	26
1906	3,971	+3,175	34
1907	3,926	—45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	—5,273	39
1911	4,593	—664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,353	+7,130	94
Dec. 31, 1916	34,804	—2,550*	80
1917	17,376	—17,428	82
1918	19,208	+1,832	74
1919	16,590	—2,618	65
1920	16,290	—300	61
1921	13,512	—2,778	68
1922	15,259	+1,747	64
1923	12,623	—2,636	64
1924	8,105	—4,518	61
1925	18,687	+10,582	53
1926	17,632	—1,055	45
1927	16,752	—880	40
1928	5,256	—11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,970	+3,484	45
1932	22,545	+9,575	55
1933	41,698	+19,153	78
1934	44,007	+2,309	62

* Represents decrease for six months.

Table IX—Railroads in the Hands of Receivers or Trustees on December 31, 1934

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Funded debt outstanding	Capital stock outstanding	Tota o company securities	Remarks
Akron, Canton & Youngstown	171	19	Apr. 3, 1933	$3,550,000	$1,500,000	$5,170,000	
Alabama, Florida & Gulf	29	29	Jan. 29, 1930	None	None	.....	
Ann Arbor	294	294	Dec. 4, 1931	9,164,341	7,250,000	17,101,798	
Apache	72	72	Sept. 29, 1931	1,055,000	600,000	1,655,000	
Apalachicola Northern	99	99	May 28, 1932	2,000,000	1,000,000	3,000,000	
Boyne City, Gaylord & Alpena	92	92	Nov. 21, 1931	800,000	669,800	1,469,800	This company was purchased by 90% of the bondholders, January 5, 1935.
California & Oregon Coast	15	15	Feb. 19, 1925	528,200	350,000	903,200	
Cape Girardeau Northern	13	104	Apr. 14, 1914	1,146,000	110,000	1,431,900	
Central of Georgia	1927	1460	Dec. 19, 1932	53,722,000	20,000,000	77,325,000	
Chesterfield & Lancaster	33	32	Apr. 14, 1931	186,000 (a)	500,000	686,000	
Chicago & Eastern Illinois	939	822	Sept. 15, 1933	33,587,036	45,891,400	80,520,836	
Chicago, Attica & Southern	155	140	Aug. 4, 1931	441,200	2,294,452	2,735,652	
Chicago, Indianapolis & Louisville	644	618	Dec. 30, 1933	26,071,000	15,488,300	42,576,640	
Chicago, Springfield & St. Louis	87	79	Jan. 24, 1930	500,000	205,275	705,275	This road was sold at foreclosure sale on June 25, 1931, but the receiver is still operating the property.
*Coeur d'Alene & Pend d'Oreille	21	21	Aug. 30, 1933	544,000	544,000	1,088,000	
Colorado-Kansas	25	24	July 1, 1931	None	None		Obligations and indebtedness pursuant to Trustee's Sale of Foreclosure and Receivership, $25,170.57. Following trustee's foreclosure sale on Sept. 30, 1932, receiver was discharged and reappointed as receiver in operation of the property during the redemption period for the bondholders, and during reorganization period.
**East & West Coast	side track		Feb. 2, 1931	624,333	250,000	889,333	
Florida East Coast	812	807	Sept. 1, 1931	57,000,000	37,500,000	99,480,075	
**Florida, Western & Northern	233	233	Feb. 2, 1931	14,999,000	5,000	15,169,000	
Fonda, Johnstown & Gloversville	64	62	Apr. 20, 1933	6,174,000	3,000,000	9,239,052	
Fort Smith & Western	250	197	June 1, 1931	5,244,000	1,248,000	6,719,434	Capital stock represented by 62,400 shares of no par value.
Gainesville Midland	74	72	Feb. 15, 1921	949,285	550,000	1,499,285	See *Railway Age*, Jan. 5, 1929, p. 67.
Georgia & Florida	409	364	Oct. 19, 1929	7,446,000	13,382,441	21,873,441	Capital stock includes 100,000 shares common of no par value.
**Georgia, Florida & Alabama	192	192	Nov. 7, 1931	1,750,000	2,010,678	4,060,678	Capital stock includes 10,000 shares common of no par value.
Georgia, Southwestern & Gulf	36	35	Jan. 2, 1933	76,800	14,700	91,500	
Gulf Coast Lines	1858	1625	July 1, 1933	53,535,000	15,000,000	69,911,000	
International-Great Northern	1160	1106	July 1, 1933	48,359,000	7,500,000	57,563,000	
Jacksonville & Havana	60 (b)	42	Feb. 1, 1930	300,000	160,810	460,810	
Louisiana Southern	59	59	Aug. 2, 1933	1,000,000	100,000	1,100,000	
Meridian & Bigbee River	46	46	June 15, 1933	1,000,000	300,000	1,300,000	
Minneapolis & St. Louis	1648	1549	July 26, 1923	44,525,072	25,792,600	71,502,672	
Missouri & North Arkansas	365	335	May 5, 1927	3,500,000	3,000,000	7,200,000	
Missouri-Illinois	214	137	July 1, 1933	2,737,500	2,250,000	4,987,500	
Missouri Pacific	7361	6811	July 1, 1933	349,701,000	154,639,600	519,114,000	
Mobile & Ohio	1202	913	June 3, 1932	31,563,000	6,007,200	42,871,799	
Nevada Copper Belt	41	41	Apr. 2, 1925	622,000	.....	622,000	
Norfolk Southern	933	790	July 27, 1932	15,401,000	16,000,000	31,640,400	
North & South	41	41	Aug. 1, 1924	None	None	5,627,222	Court order judgments $4,911,771.
***Northern Ohio	152	152	Apr. 3, 1933	3,300,000	4,230,000	7,530,000	
Northwestern Railroad Company of South Carolina	81	76	Oct. 1, 1934	360,000	100,000	460,000	
Pittsburg, Shawmut & Northern	195	158	Aug. 1, 1905	14,655,600	15,000,000	31,700,020	
Pittsburgh & Susquehanna	18	18	Apr. 22, 1931	300,000	300,000	600,000	
Raleigh & Charleston	20	20	May 1, 1931	550,000	574,500	1,124,500	
Rio Grande Southern	174	174	Dec. 16, 1929	4,509,000	4,510,000	9,065,000	
Rock Island Lines	8298	7810	Dec. 1, 1933	310,533,710	128,909,212	470,325,922	
Rutland, Toluca & Northern	21	21	Mar. 16, 1931	225,000	97,000	322,000	
St. Louis-San Francisco	5237	5087	Nov. 1, 1932	268,168,767	114,589,791	399,418,558(c)	
Sandy River & Rangeley Lakes	42	96	July 8, 1923	837,000	340,000	1,177,000	
Santa Fe, San Juan & Northern		32	Oct. 14, 1931		500,057		No other information available.
Savannah & Atlanta	145	142	Mar. 4, 1921	3,365,000	2,250,000	6,115,000	
Seaboard Air Line	4309	3329(d)	Dec. 23, 1930	128,725,841(e)	85,110,662	243,086,803	
**Seaboard-All Florida	184	184	Feb. 2, 1931	17,881,667	2,500	18,008,167	
Shelby Northwestern	22	22	Sept. 15, 1932	300,000	25,000	325,000	
Sierra Railway Company of California	79	79	May 5, 1932	1,747,000	3,248,000	4,995,000	
Spokane International	164	139	Aug. 28, 1933	4,200,000	4,200,000	8,400,000	
Tallulah Falls	57	57	June 24, 1923	1,519,000	323,400	1,842,400	
Tennessee, Kentucky & Northern	19		Nov. 24, 1933	None	10,000	10,000	Abandoned in 1934.
Tonopah & Goldfield	102	93	July 20, 1932	None	1,051,500	1,051,500	
Wabash	2447	2003	Dec. 1, 1931	122,458,326	138,120,700	294,476,820	
Waco, Beaumont, Trinity & Sabine	115	115	Feb. 8, 1930	330,000	1,113,000	1,503,000	
Wichita Northwestern	99	99	Nov. 10, 1922	381,750	1,690,000	2,116,750	
Wilmington, Brunswick & Southern	35	35	Mar. 17, 1933	183,750	165,000	348,750	
Wisconsin Central	1119	1014	Dec. 2, 1932	44,803,000	27,392,200	72,195,200	

* Leased to Spokane International.

** Leased to Seaboard Air Line.

*** Leased to Akron, Canton & Youngstown.

(a) Exclusive of $67,000 principal amount of Second Mortgage 6 per cent Bonds matured Jan. 15, 1918.

(b) This company has the right to operate over the Chicago, Burlington & Quincy between Jacksonville and Waverly, a distance of 17.95 miles.

(c) Includes $6,506,000 funded debt matured, but unpaid and $1,339,000 equipment trusts matured, but unpaid.

(d) Includes 8.50 miles owned but not operated.

(e) Exclusive of pledged securities and exclusive of the following issues which became due on the dates indicated, no provision for the payment of such issues having been made up to the present time, viz:

Raleigh & Augusta Air Line First Mortgage Bonds Extended	Jan. 1, 1931	$1,000,000
Seaboard Air Line Railway Co. Three Year Secured Notes	Feb. 1, 1931	7,500,000
Seaboard & Roanoke First Mortgage Bonds Extended	July 1, 1931	2,500,000
Seaboard Air Line Ry. Atlanta-Birmingham First Mortgage Bonds	May 1, 1933	5,910,000
Florida West Shore Ry. First Mortgage Bonds	Jan. 1, 1934	755,000
Georgia, Carolina & Northern Ry. First Mortgage Bonds Extended	July 1, 1934	5,360,000
Miscellaneous obligations—due various dates		28,429

The Cincinnati, New Orleans & Texas Pacific in November paid an extra dividend of $3 on its common stock in addition to the regular semi-annual distribution of $4.

Maturing Obligations

Railroad obligations maturing in 1935 will be the lightest in three years, according to the compilation of Dow, Jones & Co. They will total $312,357,940, compared with $448,899,260 in 1934, $336,306,260 in 1933 and $269,986,170 in 1932. This year's figure is less than half that of two decades ago, the record total of 1915, at $625,500,000.

Only a half dozen maturities run into eight figures, the outstanding issue being $28,978,900 Colorado & Southern refunding and extension 4½s, due May 1.

Receivership Situation Unchanged

There was little change in the roads in the hands of receivers or trustees during the year. Only one line, 81 miles in length, came into the hands of the courts during the year — affording a marked and pleasing change from the preceding year, when companies with 21,222 miles of line went bankrupt. The total mileage operated by receivers still exceeds that of any previous period in history, and, except for the aid of the Reconstruction Finance Corporation, the total would be much higher.

No definite progress was made during the year in reorganizing any of the large companies which are in the hands of trustees or receivers. Tentative plans were formulated by interests concerned in several such companies, but they continued in the discussion stage throughout 1934. If Congress permits the R. F. C. to purchase securities for its own account or for that of the railways, and if it modifies the bankruptcy act in one or two particulars, perhaps the present year may witness greater progress in the matter of reorganizations.

A Review of Railway Operations in 1934

(*Continued from page 107*)

increase over the corresponding period of 1933. The increase was 2.2 per cent in fatalities and 12.3 per cent in non-fatal injuries.

Total fatalities to nontrespassers at highway grade crossings increased 1.6 per cent over 1933, while non-fatal injuries increased by 24.2 per cent.

Railway Employees

The number of men and women on railway payrolls during 1934 averaged 1,009,000 compared with 971,000 in 1933, an increase of 3.9 per cent. Aggregate compensation to employees increased from $1,404,000,000 in 1933 to $1,510,000,000 in 1934, or 7.5 per cent.

Average employee earnings in 1934 were affected by changes in force and working hours, and by the restoration on July 1 of one-fourth of the 10 per cent pay deduction. Annual earnings per employee averaged $1,496 in 1934, compared with $1,445 in 1933. Hourly compensation per employee averaged 63.2 cents in 1934, against 62.9 cents in 1933.

Summary

Encouraging improvement in financial results during the first half of 1934 was followed by a discouraging downward trend, due in part to declining traffic and in part to rising costs of operation. The year as a whole produced a net deficit greater than in 1933, but not so great as in 1932. Other forces at work during 1934—possible rate increases, organization of a vigorous association to meet railway problems, and contemplated new legislation—may have their wholesome effect in 1935. In the last analysis, as always, railway results in 1935 will depend largely on the level of general commercial activity in the coming year.

With every phase of railway operation and regulation subject to possible changes in 1935, the year offers infinite opportunity for speculation and conjecture.

P. W. A. Loans to Railroads

MOST of the equipment purchased by the railroads during the year 1934, as well as a considerable amount of maintenance and construction work on equipment, roadway and structures, was financed with loans made by the Public Works Administration, under a provision of the national industrial recovery act passed in 1933 authorizing it to aid in the financing of railroad maintenance and equipment upon

Total Funds Advanced Under Railroad Contracts to December 31, 1934

Railroad	Date	Contract Amount	Purpose	Advances Amount
Baltimore & Ohio (3)	3/19/34	$4,500,000	Rail and equipment repairs	$4,340,000
	6/14/34	1,000,000	Construction of gondola cars	302,000
	6/14/34	900,000	Acquisition of passenger cars	—
Boston & Maine (4)	3/1/34	910,000*	Equipment repairs	910,000*
	3/13/34	2,230,000*	Rail	2,230,000*
	5/4/34	1,550,000*	Roadway repairs	1,550,000*
	6/26/34	2,628,000	New equipment	575,000
Central of Georgia	3/22/34	120,000*	Rail	109,000*
Chesapeake & Ohio	2/8/34	16,876,000	New equipment	15,938,000
Chicago & E. Ill.	2/2/34	240,000*	Rail	240,000*
Chicago & N. W.	1/31/34	1,400,000*	Rail	1,400,000*
Chicago Gr. W.	5/8/34	1,200,000*	New equipment	1,120,000*
C. M. St. P. & P. (2)	3/6/34	2,317,000*	Rail, air-conditioning, and auto-loader	2,317,000*
	3/31/34	1,716,000	Company-constructed equipment	1,537,000
Del. L. & W. (2)	4/19/34	3,623,000*	New equipment	3,619,000*
	5/9/34	1,043,000	Reconstructed equipment	434,000
Erie (2)	2/13/34	11,282,000	New equipment	10,686,000
	3/14/34	2,671,000	Rail and equipment repairs	2,560,000
Gr. Trunk Western	5/8/34	250,000*	Rail	250,000*
Great Northern (2)	4/2/34	4,935,000	Roadway and equipment repairs	4,240,000
	5/16/34	850,000*	Equipment repairs	850,000*
Gulf, M. & N. (4)	8/31/34	95,000*	New equipment	95,000*
	8/31/34	347,000*	New equipment	347,000*
	6/19/34	255,000*	Rail	255,000*
	8/30/34	350,000	New equipment	—
Illinois Central	12/12/34	12,000,000	New equipment, rail repairs and improvements	9,700,000
Interstate	4/5/34	250,000*	Rebuilt equipment	250,000*
Kan. Okla. & Gulf	2/20/34	255,000*	Rail	255,000*
Lehigh Valley (2)	1/20/34	2,000,000*	Equipment repairs	2,000,000*
	11/28/34	3,345,000	New and rebuilt equipment	759,000
Lehigh & N. E.	2/26/34	1,212,000*	New equipment	1,212,000*
Maine Central	4/9/34	313,000*	Rail	313,000*
Midland Continental	4/25/34	36,000*	New equipment	36,000*
Missouri Southern	8/15/34	32,500	New equipment	—
New York Central	4/25/34	2,500,000*	Rail	2,500,000*
N. Y. C. & St. L.	2/19/34	5,028,000	New equipment	4,809,000
N. Y. N. H. & H. (2)	4/11/34	4,800,000	Rail and equipment repairs	3,945,000
	4/17/34	2,300,000	New equipment	755,000
N. Y., O. & W.	3/28/34	235,000*	Rail	235,000*
Northern Pacific	2/13/34	1,220,000*	New equipment	1,220,000*
Pennsylvania (5)	11/1/34	37,000,000	Electrification	23,490,000
	11/1/34	8,550,000	New locomotives—outside shops	2,775,000
	11/1/34	14,450,000	New locomotives—company shops	3,293,000
	1/22/34	17,000,000	New freight cars	15,525,000
	2/9/34	3,650,000*	Rail	3,648,000*
Pittsburgh & W. Va.	3/8/34	331,000*	New equipment	331,000*
Southern Pacific	1/30/34	12,000,000*	Rail and equipment repairs	12,000,000*
Wabash	2/27/34	1,481,000	Rail and equipment repairs	1,295,000
TOTAL		$193,276,500		$146,250,000

*(Total Contracts completed $39,292,000)

approval by the Interstate Commerce Commission. Although the act was passed in June, 1933, the railroads at first showed little eagerness to avail themselves of its possibilities and it was not until after many efforts had been made by government officials to persuade the roads to take advantage of this opportunity to create business and employment in the durable goods industries that the first applications were made for such loans in November, 1933.

To induce railroads to undertake such expenditures the P. W. A. offered loans at 4 per cent interest, with no charge for interest for the first year, provided the roads could furnish adequate collateral, security, and in the case of equipment it accepted equipment trust certificates for 100 per cent of the amount. Some roads that would have liked to take advantage of the opportunity were unable to satisfy the requirements as to security.

$193,276,500 Loaned

Loans to the amount of $193,276,500 to 30 roads were contracted for by the end of 1934, the first contract for such a loan, that for $77,000,000 to the Pennsylvania, having been signed on December 29, 1933, and $146,250,000 of the amount was actually advanced to the roads during the year. The P. W. A. had tentatively set aside $200,000,000 for railroad loans and allotments for the purpose were made to the amount of $199,607,800, but this included part of a blanket allotment of $51,000,000 originally made for loans for the purchase of rails, all of which was not used for that purpose. Later loans for other purposes were charged against the blanket allotment and only about $25,000,000 of the amount was used for the purchase and laying of rails and fastenings, so that approximately $6,000,000 originally allotted for railroad loans had not been taken by the end of the year.

This $6,000,000 was still available at the end of the year, but an additional loan of $2,350,000 to the Wabash was authorized on January 16 and loans of $1,206,000 to the New York Central and of $80,000 to the Great Northern were announced on January 21. Possibly other amounts could be allotted for railroad loans by the P. W. A. from unused portions of other allotments or amounts made available by the sale of securities, but only $15,000,000 for railroad loans was included in the budget estimates for the fiscal year 1936 transmitted to Congress by the President on January 7, representing an estimate of the unexpected balance of allotments already made, and there has been no announcement of any plans for a new program of railroad loans. However, administration bills were introduced in Congress on January 18 enlarging the powers of the R. F. C. with respect to loans to railroads, authorizing it to "aid in the financing, reorganization, consolidation, maintenance, or construction," and to purchase or guarantee railroad obligations, including equipment trust certificates.

Extent of Work Done

The P. W. A. has estimated that approximately 150,000,000 man-hours of employment, extending into every state, were created by its railroad loans, including 52,000,000 for men and women called back to regular employment by railroad companies and equipment manufacturers and the balance for those employed in the production of more than $100,000,000 worth of materials and supplies. When the railroad program was at its peak last summer 70,000 were directly employed by the railroads and equipment manufacturers on work financed by the loans, and it was estimated that about twice as many were given employment in the production and processing of materials. According to reports available up to December 15 the shop and track forces of the railroads which received loans had been paid $24,686,211 for 44,153,144 hours of labor.

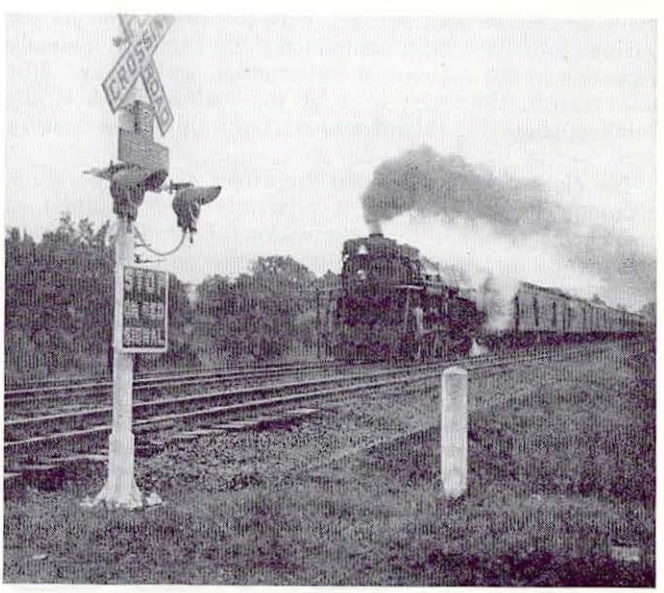
Much modern equipment, including stream-lined trains and air-conditioned passenger coaches, was included in that purchased with the aid of these loans, and the Pennsylvania has practically completed the electrification of its New York-Washington lines, on which work had been suspended. Loans of $133,886,250 were made to 23 railroads for maintenance and construction work to be done by their own employees. Loans of $58,913,050 were made to 18 railroads for new locomotives, and freight and passenger cars manufactured in outside shops. These equipment purchase loans resulted in the placing of orders for 14,675 freight cars, 264 passenger train cars, 70 steam locomotives, 20 Diesel locomotives, 33 electric locomotives, and 3 articulated high-speed trains. Orders for equipment were placed with 26 manufacturers. Of the $133,886,250 loaned to railroad companies to put their own employees back to work, $65,580,484 was loaned to create employment for shopmen. Fourteen railroads received such loans for the repairing, rebuilding, and modernization of 32,863 freight cars, 1,698 locomotives, and 1,950 passenger cars, and the building of 88 new locomotives, 10,756 freight cars, and 75 passenger cars in company shops.

New Equipment and Materials

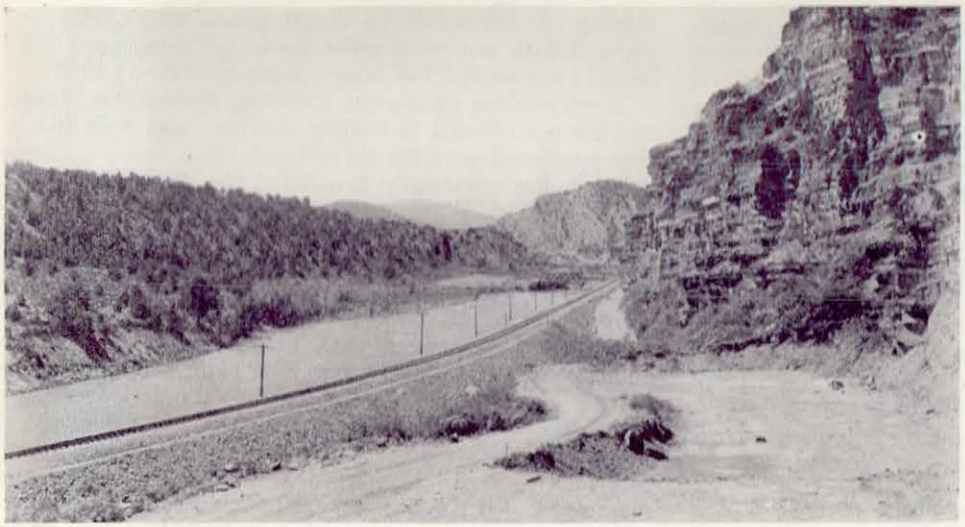
Reports to the P. W. A. show that 14,425 new freight cars, 170 passenger cars, and 61 locomotives ordered from outside shops had been completed by the end of the year. The repair work also was rapidly nearing completion, with 30,600 freight cars, 1,445 passenger cars, and 1,584 locomotives finished. Loans to the amount of $68,305,766 were made to 19 railroads for roadway work, $24,487,968 of this being for purchasing and laying new rails and fastenings. Materials purchased for roadway improvements totalled $35,732,000.

Through the Reconstruction Finance Corporation the P. W. A. has sold $13,362,000 of railroad securities taken as evidence of the loans, and the money has been turned into the P. W. A. revolving fund where it is available for reallotment. It is also planning to sell some $15,000,000 of Pennsylvania equipment trust certificates and others will be offered from time to time.

* * *



The Erie Limited near Smithboro, N. Y.



Along the Dotsero Cut-off, the Longest New Line Completed in 1934

Railway Construction at Low Ebb

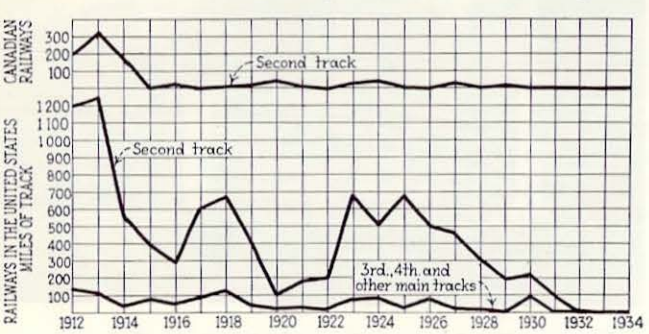
New-line mileage increases to 76, while other activities showed still further recession—Abandonments set new record

By George E. Boyd
Associate Editor, Railway Age

WITH a few exceptions, railway construction continued in a state of almost complete paralysis during 1934, reaching an even lower level than in 1933. The contrast with former years stands out more clearly by reason of the fact that many projects have been completed and little new work has been started to offset that which has thus disappeared from the record.

Prior to 1930, the number of new projects undertaken in any year approximately balanced the number that were completed during the same period, so that the volume of construction under way remained fairly constant. Since 1930, however, relatively little improvement work has been started, with the result that as the various jobs have been completed there has been a steady recession in the amount of construction under way. For this reason, the carry-over at the end of 1934 is the smallest since this record was started a third of a century ago.

No class of work escaped the effect of this recession, although by comparison, a relatively large amount of work was done in the elimination of grade crossings. Several roads have found it possible to undertake grade-crossing elimination projects of considerable magnitude as a result of grants made by the NRA and the PWA to various cities and state highway departments. In some of these cases the entire cost of these projects is being borne by these grants; in others, the railways are participating in the cost up to as much as 50 per cent. Another exception is the construction or replacement of bridges, some work of this character having also been made possible through loans obtained from government agencies.



Multiple-Track Mileage Completed Hit New Low in 1934

Miles of Main Track Built in 1934

United States	Number of companies building	First track	Second track	Third track	Fourth track	Total
Alabama	1	16.44	..	..	..	16.44
California	1	0.15	..	..	..	0.15
Colorado	1	38.10	..	..	..	38.10
Florida	1	2.70	..	..	..	2.70
Maryland	1	..	..	1.26	..	1.26
Missouri	1	0.02	..	..	..	0.02
Montana	1	13.75	..	..	..	13.75
New Jersey	3	4.26	1.82	0.15	..	6.23
New York	1	..	0.56	..	..	0.56
North Carolina	1	1.00	..	..	..	1.00
		76.42	2.38	1.41	..	80.21

New-Line Mileage Increases Slightly

It has been found over a long period that the mileage of new lines under construction or completed during the year is an excellent index of construction activities as a whole. That it can still be accepted as such is indicated by the fact that, while there was an increase of 52 miles of lines completed last year as compared with 1933, the mileage completed during the year was less than for any year since the Civil War except 1933.

During the year, 76 miles of new lines were placed in operation, the Dotsero cutoff of the Denver & Rio

Grande Western representing 50 per cent of the total. The Meridian & Bigbee River completed 16 miles between Cromwell, Ala., and Naheola, and has slightly more than 4 miles still under construction. The Chicago, Milwaukee, St. Paul & Pacific also completed a branch 14 miles long out of Sunset, Mont. The remainder of the new mileage was in short stretches, either as part of other construction projects, for the purpose of obtaining access to industries or in connection with abandonments, where one road abandoned part of its own line after obtaining running rights over the line of another.

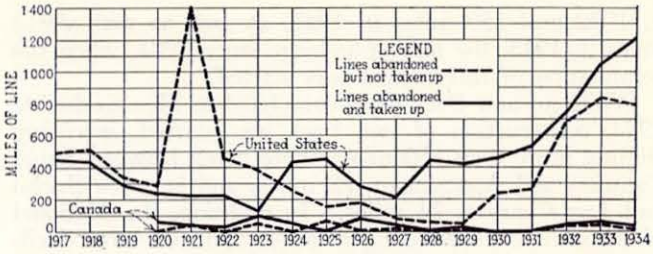
This record of 76 miles of new lines completed in 1934, compares with 24 miles in 1933 and 163 miles in 1932, being the second lowest since this record was started in 1893. It is in sharp contrast with the 6,026 miles that were placed in operation in 1902, which was the maximum for any one year, and with the 5,652 miles that were completed in 1903.

Miles of New Line Completed in the United States Since 1893

1893	3,024	1914	1,532
1894	1,760	1915	933
1895	1,420	1916	1,098
1896	1,692	1917	979
1897	2,109	1918	721
1898	3,265	1919	686
1899	4,569	1920	314
1900	4,894	1921	475
1901	5,368	1922	324
1902	6,026	1923	427
1903	5,652	1924	579
1904	3,832	1925	644
1905	4,388	1926	1,005
1906	5,623	1927	779
1907	5,212	1928	1,025
1908	3,214	1929	666
1909	3,748	1930	513
1910	4,122	1931	748
1911	3,066	1932	163
1912	2,997	1933	24
1913	3,071	1934	76

Among the projects still under construction at the end of 1934, were the line being built by the United States Reclamation Bureau from Odair, Wash., to the site of the Grand Coulee dam, 28.5 miles; and a similar line from Wiota, Mont., to the site of the Ft. Peck dam, 14 miles. Two projected lines have received authority from the Interstate Commerce Commission for their construction, these being the Mayo & Cook's Hammock, between Mayo, Fla., and Cook's Hammock, 13 miles; and the Quebec Extension between Washburn, Me., and Lac Frontier on the international boundary, 112 miles, the latter reviving a project that has lain dormant for several years.

Eight applications asking authority for the construction of 174 miles of road were filed with the Interstate Commerce Commission during the year ending October 31. During this year, 19 certificates were issued authorizing the construction of 70 miles of new lines; four applications, covering 882 miles of new lines, were denied; and seven, covering 259 miles, were dismissed. Among the applications disposed of during the year were several that were pending at the close of the previous year.



Abandonments in the United States Set New Record in 1934

Since the effective date of the Transportation Act, the commission has authorized the construction of approximately 9,762 miles of new lines, of which 6,827 miles have been completed, and about 1,649 miles abandoned or deferred; while the remainder, 1,286 miles, represents cases in which the specified completion dates have not expired. In considering these figures, it should be borne in mind that they do not correspond with the statistics herewith presented, for the reason that some of the certificates were issued to electric interurban lines and others for tracks which are not intended to become main lines, but are rather long industrial tracks, neither of which are included in our statistics of new lines constructed.

Construction of new lines in Canada was at a complete standstill. No new lines were completed in 1934, the new main track shown being in connection with a line revision on the Canadian National near McLure, B. C. This compares with no mileage in 1933, with 121 miles

Miles of New Lines Completed in Canada Since 1904

1904	316	1919	433
1905	1,181	1920	305
1906	1,007	1921	252
1907	976	1922	145
1908	1,249	1923	655
1909	1,488	1924	615
1910	1,844	1925	414
1911	1,898	1926	335
1912	2,232	1927	310
1913	3,013	1928	723
1914	1,978	1929	841
1915	718	1930	385
1916	290	1931	250
1917	207	1932	121
1918	135	1933	0
		1934	1

New Lines Constructed in the United States Increased to 76 in 1934; Only One Mile Completed in Canada

in 1932 and 250 miles in 1931, as well as with 3,013 miles in 1913, the largest mileage since 1904, when the compilation of this record was started.

While no new lines were completed in Mexico during 1934, construction of two lines was started, involving slightly more than 150 miles, these being between Santa Catarina and Apatzingan, 78 miles, and between Suchil and Las Charcas, 74 miles. In addition, the National of Mexico is constructing a large yard and other facilities in the City of Mexico.

Miles of Lines Abandoned in the United States Since 1917

1917	942	1926	457
1918	959	1927	282
1919	637	1928	512
1920	536	1929	475
1921	1,626	1930	694
1922	677	1931	795
1923	513	1932	1,452
1924	693	1933	1,876
1925	606	1934	1,995

Multiple Track Mileage

For obvious reasons, the construction of multiple tracks came practically to a standstill during 1934, only 2.38 miles of second track and 1.41 miles of third track having been completed, involving four projects, all of which were in connection with and part of other construction projects.

A Few Large Projects

Among the larger projects under way during 1934, the Pennsylvania continued its terminal improvements at Philadelphia, Pa., and its track elevation at Newark, N. J., as well as the electrification of its lines between New York and Washington, D. C. Including these major projects it was carrying out the largest program of construction of any road in North America, the total amount involved being about $200,000,000.

The New York Central also continued to carry forward its West Side improvements in New York, but as much of this work has already been completed, the volume of this construction was considerably less than in former years. This road also has under construction a project of major importance at Syracuse, N. Y., where a line diversion is being built to remove its main-line tracks from the streets through the business district of

Lines Abandoned in the United States, Canada and Mexico in 1934

United States	Lines abandoned and taken up Miles	Lines abandoned but not yet taken up Miles
Alabama & Northwestern		
Pine Hill, Ala., to Sweetwater	21.00	
Alton		
Fulton, Mo., to South Cedar City	24.05	
Atchison, Topeka & Santa Fe		
Byars, Okla., to Purcell	21.10	
Lehigh, Okla., to Ada Junction	39.88	
Seward, Okla., to Cashion	10.61	
Oilton, Okla., to Jennings	7.42	
Medicine Lodge, Kan., to Gerlane		7.59
Nutt, N. M., to Lake Valley		13.31
Balitmore & Ohio		
Morgans Run Junction, W. Va., to Laurel Furnace	1.18	
Falls Creek, Pa., to Soldier Mine Junction	11.60	
Bare Rock		
Bare Rock, Pa., to Murdock		2.50
Boston & Maine		
Belmont, N. H., to Belmont Junction	4.20	
Newington, N. H., to Dover Point		1.70
Caro Northern		
Caro, Tex., to Mt. Enterprise	17.00	
Carolina & Northeastern		
Gumberry, N. C., to Jackson	8.00	
Central of New Jersey		
Chapel Hill, N. J., to Navesink River	2.52	
Belford, N. J., to Chapel Hill		1.66
Chicago & Illinois Valley		
Joliet, Ill., to De Pue		75.00
Chicago & North Western		
At Oconto, Wis.	0.08	
Marshfield branch, Marshfield, Mich	5.14	
At Seatonville, Ill.	0.14	
Michigamme, Mich., to Bishno	5.60	
Wabik, Mich., to Champion	1.20	
Central City, S. D		0.62
Chicago, Burlington & Quincy		
Shabbona, Ill., to Paw Paw	7.42	
Galesburg, Ill., to Fairview	29.13	
Trojan, S. D., to Spearfish	23.42	
Winfield, Iowa, to Coppock	16.55	
Martinsburg, Iowa, to Oskaloosa	22.02	
Yutan, Neb., to Allis	4.87	
Chicago Great Western		
Alturia, Minn., to Rollingstone		8.78
Eden, Minn., to Mantoeville		6.90
Chicago, Milwaukee, St. Paul & Pacific		
Midland Junction, Minn., to Zumbro Falls	35.40	
Maquoketa, Iowa, to Hurstville	1.99	
Ayres, Ill., to Ebner	8.49	
Babcock, Wis., to Norway		15.84
Mountain Camp, Wash., to East Creek		2.93
Chicago, Rock Island & Pacific		
Elwood, Kan., to Hunt Spur	6.62	
Rushville, Mo., to Wallace	11.87	
Muscatine, Iowa, to Wilton	11.88	
Wabash Junction, St. Louis, Mo., to Lackland Junction		7.26
Wiville, Ark., to Gregory		5.98
Chicago, St. Paul, Minneapolis & Omaha		
Stillwater Junction, Minn., to Stillwater Switch		2.29
Elmwood, Wis., to Weston		8.91
Christie & Eastern		
Sandel, La., to Peason		10.17
Colorado & Southern		
Lakeland, Colo., to Morrison	6.31	
Delaware, Lackawanna & Western		
Succasunna, N. J., to Chester	6.30	

United States	Lines abandoned and taken up Miles	Lines abandoned but not yet taken up Miles
Denver & Rio Grande Western		
Sand Pit, Utah, to end of branch		7.93
Donora Southern		
At Donora, Pa	0.19	
Duluth, South Shore & Atlantic		
Maringo Junction, Wis., to Superior		73.64
East Texas & Gulf		
Hyatt, Tex., to Wurtsbaugh	9.60	
Elberton & Eastern		
Washington, Ga., to Elberton	34.62	
Florida East Coast		
New Smyrna, Fla., to Orange City Junction		27.42
Gainesville & Northwestern		
Gainesville, Ga., to Helen	35.15	
Georgia & Florida		
McAdoo, Ga., to Tennille		56.66
Grand Trunk Western		
At Port Huron, Mich.		1.67
Gulf Coast Lines		
Port Barre, La., to Port Barre Junction	1.56	
Gulf, Colorado & Santa Fe.		
Bragg, Tex., to Saratoga	9.17	
Gulf, Mobile & Northern		
McLain, Miss., to Piave		25.35
Halite & Northern		
Halite, N. Y., to Cloverdale	3.20	
Hanover		
Hanover, Ill., to North Hanover	2.50	
Illinois Central		
Crain, Ill., to Sand Ridge		17.26
Mounds, Ill., to Olive Branch		10.90
Maxie, Miss., to Columbia		48.47
Hammond, La., to Covington		20.95
International-Great Northern		
Calvert Junction, Tex., to Calvert	5.30	
Long Island		
Laurelton, L. I., N. Y., to Cedarhurst		3.49
Los Angeles & Salt Lake		
Delta, Utah, to Wilson	8.26	
At Long Beach, Cal.	0.20	
Louisiana Southern		
Point-a-la-Hache, La., to Bohemia	4.80	
Louisville & Nashville		
Iron City, Tenn., to Pinkney	10.74	
Crocker Junction, Ala., to Durant	2.59	
Ft. Estill, Ky., to Lancaster	22.89	
North Alabama Junction, Ala., to Searles	3.32	
Summertown, Tenn., to Napier	10.92	
Redding, Ala., to Readers	5.47	
Gilreath, Ala., to Pritchett	1.87	
Mineral Springs, Ala., to Orono	1.45	
Maine Central		
Austin Junction, Me., to Kineo		50.44
Oquossoc, Me., to Kennebago		10.53
Woodland Junction, Me., to Princeton		10.42
Manistee & Northeastern		
Keleva, Mich., to Ruthardt's	35.56	
Michigan Central		
Barron Lake, Mich., to Niles	5.40	
Minarets & Western		
Pinedale, Cal., to Pinedale Junction	4.50	
Friant, Cal., to Wishon	39.30	
Minneapolis, St. Paul & Sault Ste. Marie		
Abbotsford, Wis., to Curtis	5.68	
Mississippi & Western		
Stevens, Miss., to Fouke		11.75

Lines Abandoned in the United States, Canada and Mexico in 1934—Continued

United States	Lines abandoned and taken up Miles	Lines abandoned but not yet taken up Miles
Missouri Pacific		
Yates Center, Kan., to West Junction	5.69	
Blue Mound, Kan., to LeRoy	34.02	
Ft. Scott, Kan., to Lomax	90.95	
Monongahela		
Adah, Pa., to Lambert	3.23	
Montana		
At Clarksville, Ark	3.00	
New Mexico Midland		
San Antonio, N. M., to Carthage	10.00	
New York Central		
Westfield, Pa., to Ulysses	14.60	
Carter, N. Y., to Raquette Lake		18.13
Lockport Junction, N. Y., to Beach Ridge		6.00
Norfolk & Western		
At North Fork, W. Va	1.43	
Northern Pacific		
Bunn, Idaho, to Sunset	2.27	
Cascade Junction, Wash., to Black Carbon	3.58	
Northwestern Pacific		
Yulupa, Cal., to Glen Ellen	5.54	
Santa Rosa, to Sebastapool		6.39
Donahue Junction, Cal., to Donahue		5.67
Norton & Northern		
Norton, Va., to Wise		4.80
Oregon-Washington Railroad & Navigation Co.		
Pine Creek, Idaho, to Heim	2.36	
Pennsylvania		
At Marion, Pa	0.62	
Pine Beach, N. J., to Island Heights	1.20	
Petty Island branch, Camden, N. J	0.20	
Jamison branch No. 2, Hannastown, Pa	0.51	
Bostonia branch, New Bethlehem, Pa		1.43
Pennsylvania-Reading Seashore Lines		
At various points Camden, N. J., to Atlantic City	9.50	
Pere Marquette		
Otisville, Mich., to Fostoria	8.73	
Reeds Lake branch, Grand Rapids, Mich	1.09	
Kirk, Mich., to Pickand	7.00	
Poplar Bluff & Dan River		
Poplar Bluff, Mo., to Ruthville	15.00	
St. Louis & Hannibal		
Troy, Mo., to Bowling Green	35.60	
St. Louis-San Francisco		
Olathe, Kan., to Stanley	8.60	
Wier Junction, Kan., to Wier City	2.83	
Wier City, Kan., to Mackie	2.76	
Hero, Mo., to Galena, Kan	3.38	
Carterville, Mo., to Joplin	5.46	
Bangert, Mo., to De Camp	12.46	
Goltra, Mo., to Sligo	6.29	
Ozark, Mo., to Chadwick	15.71	
Miller, Mo., to South Greenfield	11.76	
Vanduser, Mo., to Bloomfield	17.62	
Brownwood, Mo., to Zalma	8.57	
Marquette, Mo., to Brooks Junction	24.58	
Brownington, Mo., to Lowry City Junction	6.27	
Deckerville, Ark., to Evadale Junction		17.80
St. Louis Southwestern		
Hamilton, Tex., to Comanche	35.85	
Edson, Tex., to Stephenville	36.95	
Rob Roy, Ark., to Reydel		24.50
Seaboard Air Line		
Radium, S. C., to Pierpont	1.54	
Early Bird Junction, Fla., to Early Bird	0.71	
Southern		
Oliver Springs, Tenn., to Big Mountain	2.57	
Southern Pacific		
Dallas, Ore., to Monmouth	6.76	0.99
Felton, Cal., to Boulder Creek	7.02	0.48
Magnesite Junction, Cal., to Magnesite	2.44	
Pozo, Ariz., to Casaba	4.36	0.44
Tempe, Ariz., to Mesa	4.52	2.99
Amster Junction, Ariz., to Amster	4.35	0.53
Gallatin, Tex., to Rusk	7.51	
Hutchins, Tex., to Lancaster	4.75	
Schellville, Cal., to Yulupa		7.79
Los Guillicos, Cal., to Santa Rosa		8.03
Ramal, Cal., to Wingo		2.08
Capay, Cal., to Rumsey		18.06
Churchill, Nev., to Moundhouse		26.27
Le Franc, Cal., to Alamitos		8.45
Burro Mountain, N. M., to Tyrone		13.07
Oro Grande, N. M., to Zora		4.72
Spokane, Portland & Seattle		
Gray, Wash., to Corvallis	5.17	0.33
Stewartstown		
Stewartstown, Pa., to New Park		9.00
Superior & Southeastern		
Loretta, Wis., to Larsons		20.30
Tennessee, Kentucky & Northern		
Algood, Tenn., to Livingston	17.00	
Townsville		
Manson, N. C., to Townsville	10.50	
Tuscarora Valley		
Port Royal, Pa., to Blair's Mills	27.00	
Ursina & North Fork		
Ursina Junction, Pa., to Mays Run	5.00	
Wabash		
Shumway, Ill., to Altamont		9.48
Western Maryland		
Emoryville, W. Va., to Hartmansville	3.24	
Emoryville, W. Va., to Elk Garden	3.43	
Valley Junction, Pa., to Codorus	1.92	
Winchester & Wardensville		
Rock Enon, Va., to Wardensville, W. Va		16.80
Total	1,212.23	782.85
CANADA		
Canadian National		
Near McLure, B. C	0.69	
Brandy Creek, Ont., to Otterville		6.98
Youbou, B. C., to Kissinger		12.38
Great Northern		
Sumas, B. C., to Colebrook	35.40	
Total	36.09	19.36

the city. The Chesapeake & Ohio has continued the work of improving its lines through the mountains of Virginia and West Virginia. The largest bridge project was the new structure over the Mississippi river at New Orleans, La., which is being built by the Public Belt of that city at a total cost, including the necessary trackage, of approximately $13,500,000.

Abandoned Mileage Again Breaks Record

Contrasting strongly with the greatly reduced activity in the construction of new lines, there was an increase of 119 miles in lines abandoned in the United States, breaking last year's record with the largest aggregate abandonment for any one year during more than a century of railway operation. The total for the year was 1,995 miles, this being 1,919 miles greater than the mileage of new lines completed during the year. It compares with 1,876 miles abandoned in 1933, and with 1,626 miles abandoned in 1921, the record prior to 1933. The largest single abandonment was that of the Missouri Pacific between Ft. Scott, Kan., and Lomax, 91 miles. The Chicago & Illinois Valley came next with 75 miles, which was also the longest mileage involved in the abandonment of an entire railway. The Duluth, South Shore & Atlantic was a close third with its abandonment of 74 miles between Superior, Wis., and Maringo Junction.

Although a few lines had been abandoned from time to time, it was not until 1917 that abandonments began on a scale large enough to attract attention. In that year, 942 miles were abandoned, and this movement has continued ever since, reaching a peak in 1921, which was not equalled until 1933, the abandonments for the latter year being exceeded in 1934. Since 1917, a total of 15,706 miles of lines have been abandoned, while during the same period 10,148 miles of new lines have been constructed, leaving a net decrease for the period of 5,558 miles of main line.

During the year ending October 31, a total of 125 applications to abandon lines aggregating 2,013 miles were filed with the Interstate Commerce Commission. During the year the commission approved the abandonment of 154 lines aggregating 2,514 miles and six applications involving 161 miles were denied, while 10, covering 211 miles were dismissed.

Prior to 1932 the abandonments in both Canada and Mexico had been neglible, or nearly so. In 1932 and 1933, however, the Canadian roads abandoned a total of 282 miles. During 1934 there was a still further abandonment of 55 miles on 19 miles of which operations have been discontinued without the lines having been

formally abandoned. No mileage was abandoned in Mexico during 1934, although operation was suspended temporarily on several small roads serving mining operations.

Following is a detailed report by roads of construction projects completed or under way during 1934, the individual cost of which approximates or exceeds $100,000.

Railway Construction in the United States

Aberdeen & Rockfish

First Track: At Fayetteville, N. C., 1 mile.

Alaska

Important Work Undertaken: Raising grade, filling wooden trestles and extending embankments between M. P. 414 and M. P. 443, $100,000 (completed). General program of replacing wooden bridges with steel spans (completed).

Alton

Important Work Undertaken: Subway at Sangamon avenue, Springfield, Ill., joint with Illinois Midland, $225,000, P. W. A. project (10 per cent completed).

Alton & Southern

Important Work Undertaken: Replacement of dock facilities at Fox terminal, East St. Louis, Ill., with larger and more modern structures and mechanical equipment, $160,000 (completed).

Atchison, Topeka & Santa Fe

Important Work Undertaken: Renewal of Ashland avenue subway, Chicago (completed). Revision of alinement and construction of new bridge over Illinois and Michigan canal, Joliet, Ill. (10 per cent completed). Track and roadbed drainage, Ottawa Junction, Kan., to Pomona (50 per cent completed). Track elevation and new station facilities, Oklahoma City, Okla. (completed). Installation of four steel truss spans, Bridge 372.0, over South Canadian river, Nobscot, Okla. (10 per cent completed). Construction of Bright Angel hotel, Grand Canyon, Ariz. (30 per cent completed).

Atlantic Coast Line

First Track: Short extensions to several branch lines in Florida to permit access to mills, 2.7 miles.

Baltimore & Ohio

Important Work Undertaken: Elimination of grade crossing, LeRoy, N. Y., $254,000 (5 per cent completed). Revision of alinement and track elevation through South Philadelphia, Philadelphia, Pa., B. & O. proportion $4,400,000 (89 per cent completed—work suspended temporarily). Alterations to pier, Locust Point, Baltimore, Md., $100,400 (completed). Reconstruction of Bridge 8-C, St. Denis, Md., $285,000 (completed). Reconstruction of tracks to provide for head-on movements of traffic between Potomac Yard and Brunswick, Hyattsville, Md., $220,000 (10 per cent completed—work suspended). New freight-house and team-track facilities, Silver Spring, Md., $304,515 (30 per cent completed—work suspended). Construction of enlarged and improved passenger, freight and yard facilities at new location, Johnstown, Pa., $365,000 (30 per cent completed—work suspended). New connection to permit operation over tracks of the Pittsburgh & Lake Erie, West Pittsburgh, Pa., $252,000 (completed). Elimination of grade crossing, Blaine, Ohio, joint with state, B. & O. proportion $105,000 (completed). Elimination of highway grade crossing, Joliet road, McCook, Ill., $120,000 (completed). New connection between Toledo and St. Louis divisions, Winton Place, Cincinnati, Ohio, $513,000 (10 per cent completed—work suspended temporarily). Changes in tracks in connection with new union terminal, Cincinnati, Ohio, $787,000 (55 per cent completed—work suspended). Construction of third and fourth tracks and separation of grades at Clifton and Mitchell avenues, Cincinnati, Ohio, $2,420,000 (20 per cent completed—work on grade separation suspended temporarily). Construction of viaduct to eliminate grade crossing, Southwest highway, Chicago Ridge, Ill., $260,000 (completed). Construction of viaduct to eliminate grade crossing, Halsted street, Riverdale, Ill., $300,000 (90 per cent completed). Construction of subway to eliminate grade crossing, Ashland avenue, Riverdale, Ill., $200,000 (60 per cent completed).

(Staten Island Rapid Transit) Elimination of grade crossings, Grasmere to Dongan Hills, Staten Island, N. Y., $1,500,000 (99 per cent completed). Elimination of grade crossings, Elm Park to Mariners Harbor, Staten Island, N. Y., $1,824,000 (5 per cent completed). Elimination of grade crossings, Port Richmond to Tower Hill, Staten Island, N. Y., $1,724,000 (5 per cent completed). Elimination of grade crossings, Tompkinsville to Stapleton, Staten Island, N. Y., $1,524,000 (5 per cent completed). Elimination of grade crossings, Fort Wadsworth, Staten Island, N. Y., $942,000 (5 per cent completed).

Bessemer & Lake Erie

Important Work Undertaken: Replacing wood deck on bridge over Allegheny river with steel and concrete deck and GEO track, River Valley, Pa., $194,200 (completed).

Boston & Maine

Important Work Undertaken: Elimination of Hubbs' and Dyer's grade crossings by means of viaduct over Boston & Maine and Delaware & Hudson, Elnora, N. Y., $125,000 (completed). Filling timber trestle, Boston, Mass., $145,000 (75 per cent completed). Installation of remote control switches, simplification of track arrangement and the installation of color-light signals, Waltham, Mass., to East Deerfield and Boston to Everett Junction and Medford Junction, $613,251 (completed).

Canadian National (Lines in United States)

Important Work Undertaken: Reconstruction of grade separation structure, Woodward avenue, Detroit, Mich., to provide for street widening (to be completed in 1935).

Central of New Jersey

Important Work Undertaken: Widening subway at Spring street, Elizabeth, N. J., to accommodate state highway Route 25, railway's proportion $155,000 (completed). Replacement of existing concrete arch over Morris canal with three-span deck girder bridge having ballast deck and concrete floor, to provide room for state highway Route 1, Jersey City, N. J., $125,000 (completed).

Chesapeake & Ohio

Important Work Undertaken: Enlargement of old Lewis tunnel, Jerry's Run, Va., $106,000 (75 per cent completed). Lowering track through old Big Bend tunnel, Talcott, W. Va., $262,000 (55 per cent completed). Filling bridges No. 6017 and 6018, Maysville, Ky., $119,400 (30 per cent completed). Line revision at Narrows, Chillicothe, Ohio, $260,000 (completed). Additional coal dumper and service yard, Presque Isle, Toledo, Ohio, $1,550,500 (18 per cent completed). Construction of 13 additional tracks in terminal yard, Presque Isle, Toledo, Ohio, $151,350 (completed). Enlargement and relining of Little Bend tunnel, Hillsdale, W. Va., $349,000 (completed). Revision of line and construction of second track, Cotton Hill, W. Va., to Gauley, $1,156,000 (completed). Reconstruct part of bridge No. 11, Cincinnati, Ohio, $153,500 (completed).

Chicago, Milwaukee, St. Paul & Pacific

First Track: Sunset, Mont., to mouth of Cottonwood creek, 13.75 miles.
Important Work Undertaken: Track elevation, 2.65 miles, track depression 2 miles, eliminating 14 crossings at grade between Clark street and North Milwaukee; reduction of grades from 1.1 per cent to 0.65 per cent; construction of two new freight yards to hold 1,700 cars, Milwaukee, Wis., $4,500,000 (completed).

Chicago, Rock Island & Pacific

Important Work Undertaken: Reconstruction of train shed, LaSalle Street station, joint with New York Central, total cost $314,000 (completed).

Delaware & Hudson

Second Track: At Albany, N. Y., 0.56 miles.
Important Work Undertaken: Separation of grades at eight street crossings, Albany, N. Y., $1,000,000 (completed). Separation of grades at four streets, Whitehall, N. Y., $800,000 (completed). Elimination of grade crossing, Main street, Unadilla, N. Y., $148,000 (completed).

Delaware, Lackawanna & Western

Important Work Undertaken: Elimination of grade crossings at Mills road and Wolf run by constructing 4.7 miles of marginal concrete highway, Campbells, N. Y., to Savonna (completed). Elimination of Violet avenue, Cheektowaga, N. Y. (completed). Elimination of grade crossing, state highway, Vestal, N. Y. (completed). Elimination of four grade crossings, Lackawanna avenue, Hulett street, Brown road and county road No. 358, Horseheads, N. Y. (60 per cent completed).

Denver & Rio Grande Western

First Track: (Denver & Salt Lake Western) Dotsero, Colo., to Orestod, 38.1 miles.

Denver & Salt Lake

Important Work Undertaken: Lining 16,515 lin. ft. of Moffat tunnel with concrete, replacing original timber lining, $1,000,000 (38 per cent completed).

Erie

Important Work Undertaken: Grade separation, Oak Hill avenue, Endicott, N. Y. (completed). Grade separation, extension of Northfield road, North Randall, Ohio (completed). Track elevation to eliminate 15 city streets, Elmira, N. Y. (85 per cent completed). Elimination of grade crossing, Buffalo-Hamburg county highway No. 2, Big Tree, N. Y. (60 per cent completed). Elimination of grade crossing, College avenue, Allegany, N. Y. (50 per cent completed). Reconstruction of Bridge 134.91 over Callicoon creek, Callicoon, N. Y. (15 per cent completed). Elimination of grade crossing, Gavigan's highway, Erwins, N. Y. (completed).

Illinois Central

Important Work Undertaken: Renewal of south approach to Cairo Bridge over Ohio river, on new alinement with steel viaduct, 3,170 ft. long, consisting of deck plate girders on steel towers, Caire, Ill., $730,000 (completed). Renewal of north approach to Cairo bridge over Ohio river, replacing two 249-ft. deck truss spans, Cairo, Ill., $165,000 (30 per cent completed). Lining Tunnel 3 with concrete, Reevesville, Ill., $335,000 (completed). Renewal of Bridge J-64.10 with 890-ft. steel viaduct on new alinement and construct 0.3 mile of diverted line, Big Clifty, Ky., $182,000 (completed). Construction of 2.72 miles of double-track line on 11,735 ft. of ballast-deck creosoted-pile trestle and steel spans and 2,695 ft. of embankment approaches to raise tracks to 19.25 ft. above Gulf level, in connection with Bonnet Carre spillway, La Branch, La., $2,750,000 (50 per cent completed). Construction of single-track line 2.40 miles long on creosoted-pile ballast-deck trestle and I-beam spans to raise tracks to

26.33 ft. above Gulf level, in connection with Bonnet Carre spillway, Sellars, La., $875,000 (95 per cent completed).

Indianapolis Union

Important Work Undertaken: Elevation of 6 miles of four-track line, Indianapolis, Ind., $12,000,000 (25 per cent completed—work suspended).

Kansas City Southern

Important Work Undertaken: Installation of conveyors and platforms to facilitate handing U. S. mail, Union station, Kansas City, Mo., $150,000 (completed).

Lehigh Valley

Important Work Undertaken: Elimination of grade crossings at William and South Ogden streets, Buffalo, N. Y. (20 per cent completed). Elimination of grade crossing, Main street, Manchester, N. Y. (completed).

Louisiana & Arkansas

Important Work Undertaken: Construction of new line 2.4 miles long on pile trestle and steel spans, in connection with Bonnet Carre spillway, Sellars, La., $1,000,000 (75 per cent completed).

Mayo & Cook's Hammock

New Line Projected: Mayo, Fla., to Cook's Hammock, 13 miles, $175,789.

Meridian & Bigbee River

First Track: Cromwell, Ala., to Naheola, 16.44 miles.
Important Work Undertaken: New line, Naheola, Ala., to Myrtlewood, 4.35 miles.

Minnesota Transfer

Important Work Undertaken: Subway to eliminate grade crossing at University avenue, St. Paul, Minn., P. W. A. project, $400,000 (work started).

Missouri-Kansas-Texas

Important Work Undertaken: Elimination of grade crossing, state route No. 5, Mill street, Kansas City, Kan., $314,000, M-K-T proportion $72,710 (95 per cent completed).

Missouri Pacific

First Track: At Cape Girardeau, Mo., 0.02 miles.
Important Work Undertaken: Reconstruction of part of approaches, Bridge 223, Corning, Ark., $103,900 (40 per cent completed). Reconstruction of north approach, Bridge 131, Rochelle, La., $100,000 (42 per cent completed). Replacing Bridge 143 with concrete culvert and filling, Myrtle, Ark., $139,000 (5 per cent completed). Reconstruction of south approach, Bridge 87, Yancopin, Ark., $114,000 (completed). Reconstruction of south approach to Bridge 83, Benzal, Ark., $182,000 (65 per cent completed). Reconstruction of bridge 142, Myrtle, Ark., $115,600 (completed). Reconstruction of Bridge 148, Myrtle, Ark., $100,000 (completed). Replacing Bridge 145 with concrete culvert and filling, Myrtle, Ark., $92,000 (complete). Revision of alinement, Ft. Crook, Neb., $100,000 (completed).

New Orleans Public Belt

Important Work Undertaken: Construction of combined highway and double-track railway bridge 4.35 miles long over Mississippi river, New Orleans, La., $12,800,000 (80 per cent completed). Construction of 8.27 miles of double track on Mississippi River bridge and approaches, New Orleans, La., $200,000 (80 per cent completed). Trackage and connections with various railways to give access to Mississippi River bridge, exclusive of tracks on bridge and approaches, New Orleans, La., and Avondale, $471,560 (10 per cent completed).

New York Central

Important Work Undertaken: Elevated-track structure from Clarkson to West Thirtieth street, New York, $3,850,000 (completed). Relocation of city sewers between West Thirty-third to West Fifty-ninth streets, New York, $898,000 (98 per cent completed). Construction of warehouse and cold storage building, 802-16 Washington street, New York, $450,000 (completed). Rearrangement of tracks and signals, Ossining, N. Y., to Oscawanna, $900,000 (40 per cent completed). Elimination of grade crossing at Willow avenue, Hoboken, N. J., joint with Erie, $336,000 (30 per cent completed). Consolidation and purchase of electric service, Weehawken, N. J., $132,000 (completed).

Reconstruction of Bridge 57-A, Corning, N. Y., $290,200 (completed). Elimination of grade crossing at Railroad avenue, Palmyra, N. Y., $257,460 (completed). Reconstruction of Bridge 364, West Albany, N. Y., $300,000 (80 per cent completed). Construction of passenger line to eliminate grade crossings, Syracuse, N. Y., $15,000,000 (45 per cent completed).

Track elevation, South Bend, Ind., $325,000, N. R. A. project, N. Y. C. proportion 25 per cent (20 per cent completed). Four-track subway, Dunes Relief highway, Porter, Ind., N. R. A. project, N. Y. C. proportion 50 per cent, $100,000 (85 per cent completed). Reconstruction of train shed, LaSalle Street station, Chicago, N. Y. C. proportion $146,000 (completed).

(Michigan Central). Grade separation, Woodward avenue, Detroit, Mich., N. R. A. project, $200,000 (completed). Replacing bridge over U. S. Route 12 with longer span to give 44 ft. lateral clearance, Kalamazoo, Mich., N. R. A. project, $125,000 (completed).

(Indiana Harbor Belt). Construction of five-track subway, State Route 54, North avenue, Melrose Park, Ill., N. R. A. project, $290,000 (30 per cent completed).

New York, Chicago & St. Louis

Important Work Undertaken: Replacing 730-ft. steel viaduct with three spans of solid-floor deck girders, 320 ft., and fill remainder of opening, Willoughby, Ohio, $156,000 (completed). Extension to yard and removal of part of existing yard and construct subway on extension of Eighty-seventh street, Chicago, $371,000 (15 per cent completed).

New York, New Haven & Hartford

Important Work Undertaken: Track elevation to eliminate grade crossings at Windsor, Avon, Russell and Canton streets, Hartford, Conn., $1,200,000 (15 per cent completed). Two new steam-generating units in power plant, Cos Cob, Conn., $520,000 (completed). Two new boilers in power plant, Cedar Hill engine terminal, New Haven, Conn., $105,000 (60 per cent completed).

Northern Pacific

Important Work Undertaken: Reconstruction of bridge over Cowlitz river, Longview, Wash., $240,000 (50 per cent completed).

Pennsylvania

Third Track: Camden Terminal, Camden, N. J., 0.15 miles. At Elkton, Md., 1.26 miles.
Important Work Undertaken: Track elevation, new passenger station and express building, three bridges over Passaic river carrying six tracks, additional tracks and retaining walls, Newark, N. J. (45 per cent completed). Overhead viaduct 1,300 ft. long, to eliminate grade crossing, state highway Route 29, Newark, N. J. (completed). Electrification of freight lines, Greenville, Waverly, Passaic, Harsimus, Meadows and South Amboy branches (85 per cent completed). Electrification of freight and passenger service, New York to Washington, D. C.: Section 1, New York to Leddonfield, Pa. (80 per cent completed); Section 2, Leddonfield to Back River, Md. (90 per cent completed); Section 3, Back River to Washington (95 per cent completed).

Relocation and elevation of tracks to eliminate seven grade crossings, Norristown, Pa. (completed). Revision of line and elimination of grade crossings, Elkton, Md. (95 per cent completed). Track elevation to eliminate four grade crossings, Elmira, N. Y. (15 per cent completed). Reconstruction of bridge over Anacostia river, Washington, D. C. (85 per cent completed). Subway to eliminate grade crossing, state highway Route 40, Merchantville, N. J. (completed). Revision of terminal facilities, Camden, N. J. (completed). Construction of new passenger terminal and rearrangement of yard and engine facilities, Philadelphia, Pa. (86 per cent completed). New line and other improvements through Baltimore, Md. (50 per cent completed). Construction of Pier 1, Canton, Baltimore, Md. (completed).

Facilities for rail to river freight transfer, Baden, Pa. (30 per cent completed—part of facilities in operation, remainder of work suspended). Revision of line in connection with Pymatuning reservoir project under construction by state of Pennsylvania, Linesville, Pa. (completed). Mail-handling tunnel and tracks to serve new post office, Pittsburgh, Pa. (completed). Continuation of reconstruction of Bridge 2.42, Pittsburgh, Pa. (completed). Elimination of two grade crossings by highway diversion and construction of subway, Springbrook, N. Y. (completed). Track elevation to eliminate five grade crossings, East Aurora, N. Y. (90 per cent completed). Construction of subway to eliminate grade crossing, Fillmore, N. Y. (completed). Elimination of College Avenue grade crossing, Allegany, N. Y., work being handled by Erie (50 per cent completed).

(Englewood Connecting Railway.) Track elevation to eliminate 22 street crossings at grade, Green street to Damen avenue, inclusive, Chicago (completed).

The approximate cost of the foregoing projects is $188,473,000.

(Long Island.) Track depression, about 12 ft., to eliminate two grade crossings and construction of a station and facilities, Great Neck, Long Island, N. Y. (90 per cent completed). Track elevation to eliminate eight crossings at grade, Valley Stream, Long Island, N. Y. (completed). Widening of existing highway bridge from 60 to 145 ft., spanning four tracks, new Interboro parkway; construction of new bridge at existing grade to carry tracks over new parkway, Kew Gardens and Forest Park, Long Island, N. Y. (completed). Construction of two double-track and one single-track bridges to carry tracks over new service roads in connection with new Interboro Parkway, Forest Park, Long Island, N. Y. (completed). Track elevation to eliminate grade crossing, Carman Mill road, Amityville, Long Island, N. Y. (completed). Construction of subway to eliminate grade crossing, Central avenue, Glendale, Long Island, N. Y. (80 per cent completed).

The approximate cost of the foregoing projects is $4,185,000.

(Pennsylvania-Reading Seashore Lines.) *First Track:* Penred, N. J., to Arctic avenue, Atlantic City, 1.82 miles. At various points in making new connections, 1.46 miles.
Second Track: Penred, N. J., to Arctic avenue, Atlantic City, 1.82 miles.
Important Work Undertaken: Connection between West Jersey & Seashore and former Atlantic City Railroad, and construction of interlocking, Winslow, N. J. (completed). Connection between West Jersey & Seashore and former Atlantic City Railroad, Bulson street, Camden, N. J. (completed). Consolidation of terminals of West Jersey & Seashore and former Atlantic City Railroad, new station and grade crossing elimination, Atlantic City, N. J. (90 per cent completed).

The approximate total cost of the foregoing projects is $6,269,000.

Pere Marquette

Important Work Undertaken: Separation of grades, Phoenix road, Plymouth, Mich., $225,000 (completed). Separation of grades, Highway M-31, Ludington, Mich., $100,000 (30 per cent completed).

Quebec Extension

Line Projected: Washburn, Me., to Lac Frontier, 112 miles, $3,000,000.

Raritan River

First Track: At Kearny, N. J., 0.98 miles.

Reading

Important Work Undertaken: Reconstruction of bridge No. 146.67 over Susquehanna river, Rupert, Pa., $388,736 (completed).

Southern Pacific

Important Work Undertaken: (Pacific Lines) Reinforcement of three steel viaducts to permit Coopers E-70 loading, Jalama, Cal., and Gaviota, total length 1,680 ft., $190,000 (completed). Construction of reinforced-concrete subway to eliminate grade crossing at Julian street, San Jose, Cal., $125,000 (90 per cent completed).

(Lines in Texas and Louisiana.) Construction of produce terminal, New Orleans, La., $453,000 (65 per cent completed—work suspended temporarily). New yard and terminal facilities, Avondale, La., $135,000 (completed). New passenger station and incidental facilities, Houston, Tex., $2,300,000 (completed).

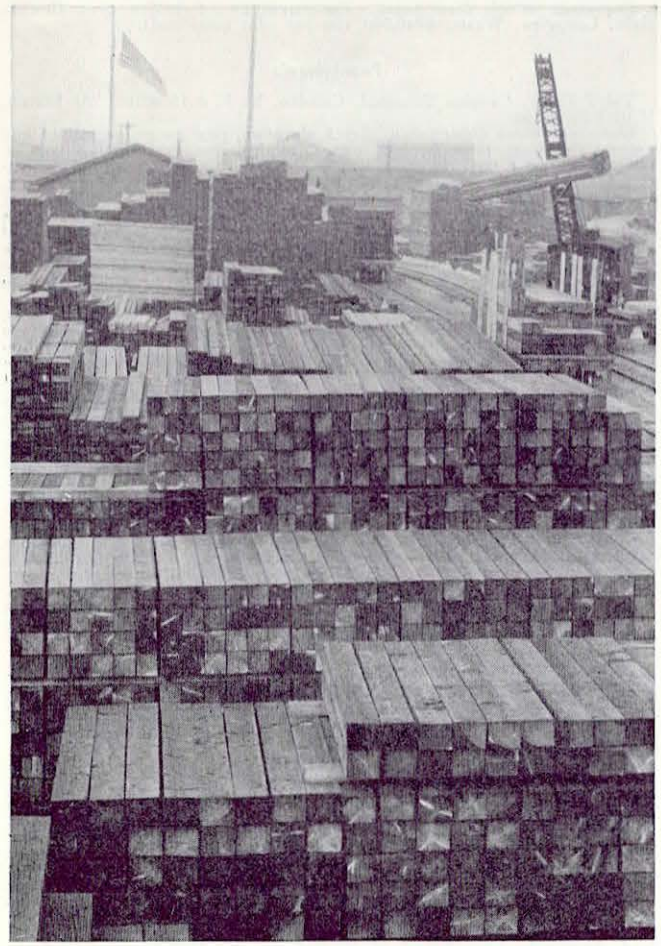
(Northwestern Pacific.) Construction of 0.154 miles of new line to con-

(Continued on page 154)

Cost of Railway Material Higher in 1934

Values mark two-year rise in prices under N.R.A. codes—Carriers apply for higher freight rates to equalize effect on expenses

By D. A. Steel
Purchases and Stores Editor, Railway Age



Increased Tie and Lumber Prices Have Cost Railroads Millions

THE year just ended was marked by a large increase in the volume of railway buying*, but it was also a year in which the railroads paid more for what they bought. Collectively, they paid more for practically every important class of material than in the previous year, when prices also increased. Counting from 1932, or better from the spring of 1933, when prices were lowest, the railroads have now had two successive years of higher material costs. The distinction between these two years is that when 1933 ended, prices were rising, and that several months before 1934 ended, prices, in general, were falling.

One road paid 27 per cent more for fuel oil last year than in 1933, another 30 per cent more, a third 80 per cent more, another 40 per cent more, another 50 per cent more, another 6 per cent more and another 10 per cent more, and another 11 per cent more. Two roads paid 10 per cent more for ties than in 1933, another road 15 per cent more, another 26 per cent more, a fourth 30 per cent more and another 40 per cent more and the inceases in lumber prices paid by different carriers varied from 5 per cent to 30 per cent.

Increases Large

Collectively, the railroads paid 17 per cent more at the mine for all the coal purchased last year and 15 per cent more for fuel oil. Disregarding fluctuations and differences between the volume of buying at different periods of the year, they paid 28 per cent more for ties, 32 per cent more for lumber, 9 per cent more for iron and steel, and 8 per cent more for miscellaneous supplies other than food, and received 15 per cent more for the scrap they sold.

Contrasted with the average prices in 1932, the railroads, collectively, paid 10 per cent more for coal and 5 per cent more for fuel oil, while they paid 25 per cent more for their ties, 90 per cent more for their lumber, 5 per cent less for their rail, 11 per cent more for products of iron and steel and 18 per cent more for miscellaneous supplies other than food, and obtained 50 per cent more in the aggregate for their scrap. Averages indicate at least a 10 per cent increase in total material costs in 1934 over 1933, and a 15 per cent increase over 1932, with present prices, in general, corresponding with those prevailing in 1930 and 1916. The figures represent the average of prices paid by the railroads during the entire years in question and thus may not reflect the full rise in prices that has occurred and which must eventually be absorbed.

The increases in material costs are more largely the result of the industrial codes than anything else. In accordance with the policies of the administration at Washington and pursuant to the National Recovery Act, all industrial groups were invited, urged and otherwise persuaded, in 1933, to adopt codes of "fair competition," which established minimum rates of pay for labor and maximum hours of work, provided for the control of production and authorized fixed prices and conditions of sale. By order of the President, the codes were continued through 1934. In so far as the terms of the codes could be understood, the railroads undertook to comply with them and they were held to the strictest observance of the N.R.A. in all purchasing with P. W. A. loans. As the year advanced and brought with it labor disturbances of serious proportions and widespread evidences of inequality and evasion of terms and caused the suspension of buying in many quarters, the impracticability of enforcing many conflicting provisions of the codes became evident. The result was that the codes were subjected to extensive revisions, including the elimination or modification of price-fixing provisions in some codes and reflecting increased recognition of the laws of supply and demand upon prices. Confronted with advancing material prices and increased costs of labor, accompanying the restoration of wages for employees, the railroads

*See *Railway Age*, January 12, 1935.

applied to the Interstate Commerce Commission for increases in freight rates directed to offset in part the increased costs of labor and material, and they reduced their buying in the last months of the year.

Moderate Increases in Steel Prices

Iron and steel prices are higher in the aggregate than they were a year ago and most items purchased by the railroads, with the principal exception of rail, commanded appreciably higher prices than they did before the codes were introduced. The increases since May, 1933, range from 5 to 30 per cent. Since last January, however, the railroads were able to obtain much material without any deviation from prices established in the last quarter of 1933. In most instances the advances during the year were under 5 per cent and there were numerous recessions following July. Changes in prices from 1933 were less pronounced than with other materials. Locomotive appliances appear to have been unaffected by the conditions of the past 12 months.

The price of steel rails, without extras, remain at $36.365 a ton, the figure fixed by agreement with the federal administration in October, 1933. Tie plates, ranging from $38 to $43.70 a net ton, with and without the inclusion of copper, represent an average increase of 8 per cent above the corresponding prices in 1933. Track bolts, ranging from $3.55 to $3.97 a cwt., are now costing the railroads 5 per cent more on the average than in 1933, while track spikes, ranging from $2.40 to $2.73 a cwt., show only a 2 per cent rise above the average cost in 1933. There was an increase in the cost of wire fencing during 1934, and the prevailing prices, ranging from 27 to 51 cents a rod for 26-in. material, reflect an average increase of 18 per cent above the cost in 1933. Track shovels, at $11.86 a dozen, also show an average increase of 12 per cent above 1933.

In general, the prevailing prices of cast iron pipe are from $1 to $2 a ton less than a year ago, and the average price paid by the railroads in 1934, ranging from $36 to $53.20 a ton, was 7 per cent more than in 1933, and 20 per cent more than in 1932. The mill price of $1.85 a cwt. paid for structural steel angles in December, 1934, was 10 cents higher than in January, and the average for the year was 7 per cent above the average in the previous year and 10 per cent above the average in 1932.

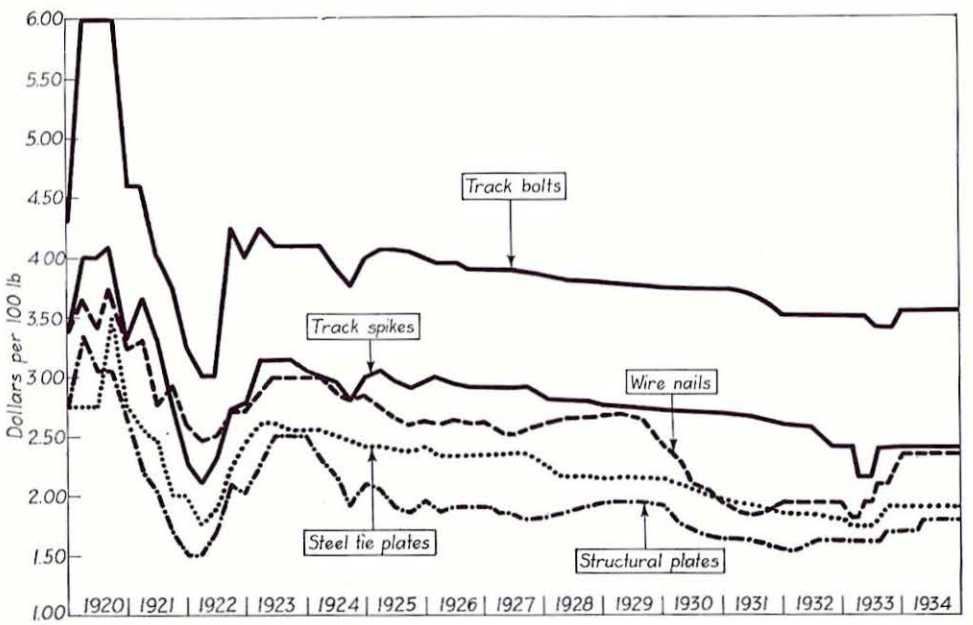
During 1934, the roads paid an average of $4.62 per 100 pieces for machine bolts, which is 4 per cent above

Average Unit Costs of Railway Material, 1914 to 1935

the average in 1933 and 15 per cent above the average in 1932, but prices in the last quarter were 5 per cent less than in January. On the other hand, boiler-tube prices were advanced during the year, the average price of 16.2 cents a foot in the last quarter being 5 per cent above that paid 12 months earlier. Bar steel was one of the materials, whose price was increased last May and June, and later reduced. However, the average price of $1.83 per cwt. paid in 1934 was 7 per cent above the average in 1933 and 10 per cent above that paid in 1932. In 1933, boiler steel averaged $1.82 a cwt. and in 1934 $2.084, an increase of 9 per cent. Most roads paid substantially more for this material last year than previously and higher prices in the last quarter of 1934 than in the first quarter.

Locomotive and freight-car brake shoes, costing $55 and $35 a ton, respectively, on all roads, were purchased in 1934 at practically the same uniform prices of 1933. Steel castings were also unchanged, but the average price of $8.65 a cwt. was 20 per cent above the corresponding average in 1933. In the case of malleable castings, which averaged $8.63 a cwt. in December, the situation is similar, but with grey-iron castings the change was less pronounced and some roads were able to fill their requirements at prices slightly below those of 1933.

Couplers, ranging from $40.20 to $44.77 a pair, have continued at the prices paid in December, 1933, while



Trend of Prices Paid for Typical Roadway Materials

Average Unit Costs of Railroad Materials

Track Materials

Description	Unit	1927	1928	1929	1930	1931	1932	1933	1934 First Quarter	1934 Mid-year	1934 Last Quarter	1934 High	1934 Low	1934 Average	Per Cent of 1933	Per Cent of 1932
Rail	N. t.	$43.00	$43.00	$43.00	$43.00	$43.00	$42.00	$38.79	$36.37	$36.37	$36.37	$36.37	$36.37	$36.37	100	85
Tie plates	Steel	45.98	42.43	42.10	41.22	38.88	36.40	36.64	39.55	39.56	39.56	43.60	38.00	39.56	108	108
Track bolts	Heat-treated, with nuts	4.00	3.83	3.75	3.94	3.74	3.42	3.52	3.72	3.71	3.71	4.17	3.55	3.71	105	108
Track chisels	Alloy steel	1.96	1.76	1.74	1.71	1.64	1.64	1.70	1.71	1.71	1.71	2.75	1.65	1.71	100	104
Track spikes	High-carbon steel	2.80	2.76	2.71	2.68	2.57	2.45	2.32	2.48	2.48	2.48	2.69	2.40	2.48	102	110
Track shovels	No. 2 carbon steel	12.95	13.82	11.28	10.02	9.98	10.93	11.53	13.20	13.37	13.37	15.95	11.86	13.31	112	120
Bond wire	48-in. copper clad	14.78	17.50	18.56	17.69	15.89	14.48	14.99	16.21	16.27	16.35	17.50	14.62	16.27	109	112
Wire fence	26-in. to 47-in. woven	Rod .467	4.88	4.26	.428	.396	.383	.370	.441	.453	.453	.580	.264	.439	118	115
Steel, structural	Angles	Cwt. b. 1.98	1.98	2.35	1.98	1.84	1.73	1.75	1.84	1.90	1.91	2.15	1.70	1.88	107	110
Steel, structural	Fabricated	Cwt. b. 4.17	4.17	3.32	3.35	2.73	2.72	2.90	3.28	3.30	3.32	4.00	2.45	3.30	114	121
Pipe, cast-iron	12-in. Class B	N. t. 41.13	41.13	39.41	40.37	35.58	33.94	37.91	40.78	40.53	40.87	51.20	36.00	40.73	107	120
Pipe, clay	24-in. vitrified	Ft. 1.39	1.38	1.16	1.76	1.40	1.95[1]	1.74[1]	1.95[1]	2.05[1]	2.05[1]	3.03[1]	1.29[1]	2.02[1]	115	105

Locomotive and Car Materials

Bolts, with nuts	¾ by 6, machine	100 pcs. 5.13	5.02	4.87	4.81	4.20	4.04	4.70	5.03	5.00	3.84	5.97	3.36	4.62	104	115
Boiler tubes	2-in. No. 11 gage steel	Ft. .172	.172	.174	.154	.152	.152	.156	.162	.161	.164	.210	.153	.162	105	107
Bar steel	Open-hearth	Cwt. b. 2.13	2.58	2.17	1.85	1.80	1.72	1.73	1.83	1.86	1.84	2.10	1.60	1.84	107	110
Steel	High-speed tool	Lb. b. .59	.58	.57	.66	.52	.49	.52	.59	.60	.61	.90	.25	.60	115	117
Steel	Boiler	Cwt. b. 2.01	2.00	2.33	2.01	1.86	1.73	1.82	2.06	2.03	2.05	2.90	1.74	2.04	109	117
Steel	Spring	Cwt. b. 2.74	2.63	2.84	2.62	2.42	2.18	2.23	2.32	2.35	2.36	3.50	1.75	2.34	105	107
Steel	24-gage black	Cwt. 3.20	2.99	3.25	2.90	2.65	2.69	2.68	2.63	2.76	2.67	3.90	2.25	2.69	100	100
Pig iron	No. 1	G. t. 20.50	20.50	17.35	16.61	15.37	14.85	15.74	19.12	19.95	19.87	22.50	17.25	19.64	125	132
Brake shoes	Locomotive driving	N. t. 61.70	61.70	59.54	60.00	56.53	54.28	54.60	54.91	55.91	55.91	60.00	54.00	55.58	102	102
Brake shoes	Freight car	N. t. 36.93	39.98	37.55	35.42	35.12	32.70	33.40	33.90	34.90	34.90	35.00	33.00	34.57	103	105
Castings, grey iron	Green sand	Cwt. 3.86	3.97	4.12	4.12	4.09	3.82	3.82	3.95	3.87	3.88	4.75	3.48	3.90	100	100
Castings, malleable	7 to 15 lb., 25 to 100	Cwt. 9.13	8.50	8.68	8.27	7.68	7.59	7.42	9.07	8.95	8.95	9.80	7.00	8.99	122	120
Castings, steel	25 to 50 lb., under 50	Cwt. 8.64	7.97	8.32	8.46	7.73	7.37	7.25	8.65	8.65	8.65	9.80	8.40	8.65	121	115
Couplers, car	5 by 7 by 6½ ARA-D	Pr. 41.20	40.20	40.20	41.20	39.20	38.13	39.20	41.35	41.91	42.32	46.80	40.20	42.00	107	110
Wheels, car	33-in. chilled iron	Cwt.						1.41	1.48	1.48	1.48	1.75	1.40	1.48	106	
Axles, locomotive	Driving, carbon	Cwt. 5.16	5.21	4.84	4.29	4.75	4.55	4.56	4.77	4.95	4.99	5.11	4.23	4.90	107	107
Axles, car	5 by 9, rough-turned	Cwt. 2.94	2.94	2.94	2.88	2.88	2.75	2.53	2.81	2.91	2.95	3.25	2.53	2.89	114	115
Tires, frt. loco	33-in., rough-bored	Cwt. 6.11	6.11	5.84	6.22	6.03	5.86	5.55	5.67	5.67	5.67	6.14	5.34	5.67	100	97
Pipe	1-in. black steel	Ft. .076	.069	.066	.067	.069	.063	.063	.066	.069	.07	.083	.052	.068	106	104
Wire nails	Common	Cwt. b. 2.58	2.62	2.62	2.29	2.07	2.18	2.23	2.49	2.67	2.72	3.06	2.35	2.62	117	120
Pig lead	Virgin	Cwt. 7.04	6.43	6.95	5.64	4.42	3.53	4.17	4.25	4.05	3.81	5.75	3.31	4.04	97	115
Copper	Sheet, soft	Lb. .218	.23	.27	.259	.181	.180	.169	.173	.18	.18	.202	.137	.178	106	100
Journal bearings	A.R.A.	Lb. .142	.141	.167	.149	.10	.07	.081	.089	.096	.095	.105	.065	.093	115	130
Wire, copper	No. 9 bare	Lb. .149	.167	.195	.163	.115	.100	.113	.132	.140	.143	.20	.094	.138	122	138
Wire, copper	T.B. weather, No. 10	Cwt. 18.70	19.73	21.00	19.00	15.81	13.00	18.30	17.84	19.01	19.72	24.04	14.90	18.80	103	145

Miscellaneous

Boiler lagging	1¼ in. by 6 by 36 mag.	Sq. ft. .21	.22	.236	.160	.155	.156	.156	.157	.157	.157	.211	.12	.157	100	100
Fire brick	Soft	M 41.74	43.08	41.73	41.85	39.29	34.70	37.20	44.16	44.69	44.89	47.50	40.00	44.58	120	128
Hose	Air-brake, 1½ by 22	Ft. .48	.46	.44	.45	.37	.33	.31	.38	.38	.41	.42	.35	.39	124	115
Leather	Belting, 6-in. double	Ft. 1.22	1.35	1.39	1.39	1.23	1.27	1.17	1.39	1.36	1.38	1.73	1.01	1.38	120	115
Rope	¾-in. manila	Lb. .217	.199	.199	.180	.153	.142	.127	.140	.147	.136	.144	.105	.141	102	108
Rope	¾-in. 6 by 19 plow steel	Ft. .125	.119	.144	.14	.143	.132	.137	.153	.154	.158	.214	.13	.155	119	115
Rubber, red	⅛-in. sheet packing	Lb. .32	.28	.247	.25	.225	.176	.172	.210	.210	.202	.500	.110	.207	120	118
Gasoline	Gal.						.049	.047	.046	.047	.047	.069	.028	.047	111	96
Oil	Long time—tanks	Gal. .096	.09	.087	.117	.062	.061	.051	.053	.053	.052	.107	.035	.053	100	87
Oil	Car—tank lots	Gal. .180	.157	.157	.163	.138	.127	.134	.134	.135	.135	.180	.110	.135	100	105
Grease	Driving box	Lb. .160	.122	.125	.131	.122	.118	.109	.106	.103	.103	.130	.091	.104	100	90
Waste	Colored cotton	Lb. .098	.091	.086	.084	.076	.051	.057	.069	.065	.059	.11	.055	.065	113	127
Creosote oil	Tank lots	Gal. .157	.157	.139	.130	.115	.108	.093	.103	.103	.107	.120	.08	.104	110	97
Glass	24 by 24 dsa.	Box 5.23	5.10	5.76	5.84	4.80	4.71	5.18	5.26	4.28	4.23	6.38	2.96	4.59	89	97
Linseed oil	Boiled	Lb. .088	.093	.117	.120	.09	.068	.087	.093	.098	.095	.121	.075	.095	109	140
White lead	In oil—100-lb. keg	Lb. .11	.102	.104	.106	.107	.088	.08	.08	.081	.082	.085	.077	.081	102	93
Cement, Portland	In paper	Bbl. 2.21	1.85	1.87	1.76	1.42	1.42	1.80	1.95	1.95	1.95	2.39	1.50	1.95	108	135
Soda ash	Water softening	Cwt. 1.33	1.40	1.46	1.56	1.55	1.30	1.21	1.36	1.36	1.32	2.67	1.09	1.35	111	100
Hydrated lime	Water softening	N. t. 13.63	11.99	11.96	9.73	9.53	9.49	8.35	8.61	8.63	8.63	10.80	6.40	8.62	103	91
Oxygen		100 cu. ft. 1.29	1.04	1.03	1.05	1.06	1.02	1.04	1.10	1.10	1.10	1.25	.60	1.10	105	108

Forest Products—Mill

Lumber	Fir, 1 by 6 No. 1 com.	M ft. 27.81	27.81	20.02	15.56	10.83	18.76[2]	25.14[2]	31.90[2]	31.22[2]	29.84[2]	41.00[2]	26.00[2]	30.90[2]	120	160
Lumber	Pine, 2 by 4 by 10, No. 1 com.	M ft. 32.93	29.99	26.21	25.83	18.93	21.83[3]	36.75[3]	45.40[3]	45.20[3]	44.60[3]	60.00[3]	26.00[3]	45.00[3]	116	145
Lumber	Fir sills, 6 by 10 by 40	M ft. 33.02	31.69	21.50	21.76	14.50	10.23[4]	13.00[4]	19.08[4]	19.41[4]	18.41[4]	21.50[4]	16.50[4]	19.00[4]	150	185
Bridge stringers	Fir, 8 by 16 by 28 struct.	M ft. 35.38	29.15	20.53	18.70	14.90	12.52[5]	15.70[5]	24.08[5]	24.25[5]	22.10[5]	27.50[5]	21.00[5]	23.50[5]	150	190
Cross ties	Fir, 7 by 9 by 8′ 6	Ea. .60	.60	.67	.80	.50	.50	.49	.77	.77	.77	.86	.58	.77	135	155
Cross ties	Pine, 7 by 9 by 8′ 6	Ea. .67	.67	.67	.77	.65	.73	.64	.61	.63	.61	.90	.40	.62	110	92
Cross ties	White oak, 7 by 9 by 8′ 6	Ea. .98	.95	.93	.92	.83	.75	.69	.87	.89	.87	1.17	.50	.87	135	115

Scrap Iron Sold

Railroad scrap	No. 1 railroad wrought	N. t. 11.16	11.39	11.96	8.68	7.20	4.20	6.65	8.64	7.61	7.61	10.20	5.50	7.96	120	190
Railroad scrap	No. 1 heavy melt	N. t. 11.63	11.34	12.82	10.62	7.33	5.34	7.32	9.25	8.21	8.20	11.15	5.50	8.55	117	160
Railroad scrap	Rails for re-rolling	N. t. 13.80	12.92	14.49	12.55	10.05	7.18	8.10	9.56	9.25	8.83	11.60	5.85	9.22	114	128

[1]Culvert, 24-in. corrugated. [2]1 by 6 by 9 B & B siding. [3]2 by 6 by 18 B & B siding. [4]6 by 6 sel. com. rgh. [5]16-in. by 32-ft., or less.

the cost of locomotive axles, now ranging from $4.53 to $5.32 a cwt., and that of car axles, ranging from $2.63 to $3.22 a cwt., show slight increases during 1934, amounting to 7 to 14 per cent above the prices paid in 1933. On the other hand, locomotive tires, at $5.34 to $6.14 a cwt. on various roads in October, like most locomotive appliances, show no change in cost since 1932. While light sheet steel cost no more in the aggregate during 1934 than in 1933, the prices have advanced since a year ago, and the same is true of wire nails, the latter material costing the railroads 17 per cent more last year than in 1933 and 20 per cent more than in 1932.

There were increases last year both in the amount of steel produced and in the consumption of steel by the railroads (the latter increasing from approximately 1,600,000 tons to 2,100,000 tons) and last summer the mills were operating at 60 per cent of their capacity. The average rate of production for the year, however, was only 40 per cent as compared with 35 per cent in 1933. Labor difficulties and other considerations resulted in increases in wage scales since the code was introduced and further increases are always possible under present conditions, but, with more than enough capacity to handle prevailing business and with the price-fixing provisions of the codes in disfavor, further increases in iron and steel prices will be made guardedly, particularly

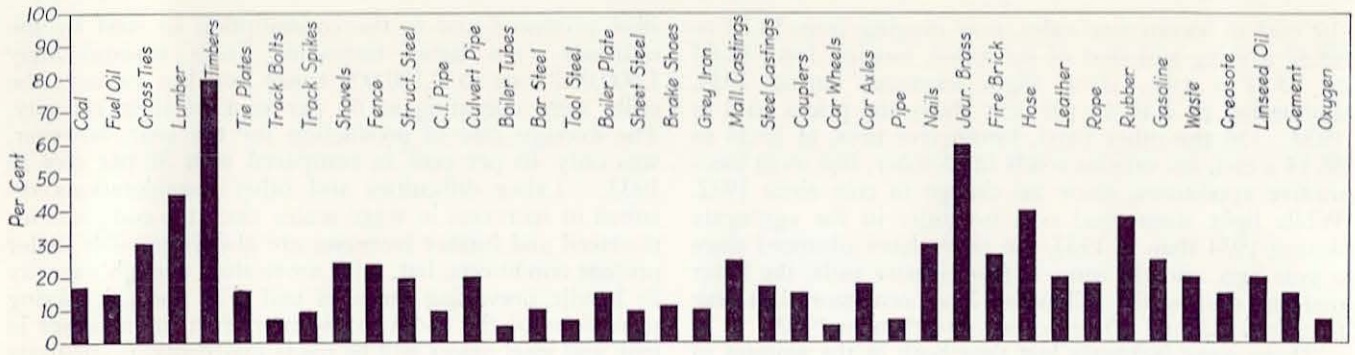
Cost Per Ton of Coal for Locomotives—Class I Railroads*

	1924 Dollars	1925 Dollars	1926 Dollars	1927 Dollars	1928 Dollars	1929 Dollars	1930 Dollars	1931 Dollars	1932 Dollars	1933 Dollars	1934† Dollars
New England Region	5.14	4.66	4.59	4.52	4.34	4.24	4.18	3.94	3.73	3.64	4.07
Great Lakes Region	3.31	2.98	2.88	2.96	2.84	2.73	2.64	2.37	2.25	2.15	2.42
Central Eastern Region	2.62	2.28	2.26	2.26	2.09	2.01	1.96	1.84	1.62	1.57	1.97
Eastern District	3.11	2.75	2.67	2.70	2.55	2.45	2.39	2.22	2.04	1.95	2.31
Pocahontas Region	2.13	1.78	1.82	1.78	1.69	1.67	1.68	1.66	1.58	1.52	1.75
Southern Region	2.78	2.40	2.31	2.26	2.19	2.10	2.06	1.95	1.79	1.74	1.99
Southern District	2.62	2.25	2.19	2.15	2.08	2.00	1.96	1.88	1.74	1.68	1.93
Northwestern Region	3.42	3.19	3.09	3.21	3.02	2.79	2.66	2.55	2.53	2.37	2.36
Central Western Region	3.06	2.90	2.83	2.83	2.68	2.51	2.49	2.45	2.24	2.11	2.14
Southwestern Region	3.16	2.95	2.85	2.88	2.64	2.42	2.29	2.15	1.88	1.76	1.79
Western District	3.22	3.02	2.94	3.00	2.82	2.61	2.53	2.45	2.31	2.17	2.19
United States	3.03	2.72	2.63	2.66	2.53	2.40	2.34	2.21	2.05	1.96	2.19

* Invoice plus freight charges—I. C. C.
† 10 months.

Average Cost of Coal Per Ton—10 Months, 1934

Region and Road	With Freight 1934	With Freight 1933	Without Freight 1934	Without Freight 1933
New England Region:				
Bangor & Aroostook	$4.24	$3.98	$4.24	$3.98
Boston & Albany	4.30	3.94	1.99	1.67
Boston & Maine	4.10	3.59	1.49	1.85
Canadian National (in New Eng.)	4.66	3.92	1.35	.48
Canadian Pacific (in Maine)	4.66	4.55	2.22	2.07
Canadian Pacific (in Vermont)	4.88	4.19	1.79	1.04
Central Vermont	4.73	4.23	1.78	1.28
Maine Central	4.61	4.14	4.61	4.14
New York, New Haven & Hartford	3.67	3.13	1.38	.80
Rutland	3.66	3.34	1.30	2.25
Great Lakes Region:				
Ann Arbor	3.41	2.77	1.61	.94
Cambria & Indiana	1.82	1.44	1.82	1.44
Delaware & Hudson	3.29	2.91	1.91	1.51
Delaware, Lackawanna & Western	2.96	2.90	1.53	1.43
Detroit & Mackinac	3.96	3.39	1.66	1.06
Detroit & Toledo Shore Line	3.39	2.90	1.81	1.29
Erie and Chicago & Erie	2.22	1.88	1.70	1.32
Grand Trunk Western	2.93	2.57	1.30	.88
Lehigh & Hudson River	4.08	3.33	1.56	.80
Lehigh & New England	3.02	2.74	1.36	1.12
Lehigh Valley	3.35	2.85	1.53	.98
Michigan Central Lines	2.14	1.67	2.05	1.56
Monongahela	1.56	.97	1.56	.97
Montour	1.80	1.56	1.80	1.56
New Jersey & New York	4.63	4.34	1.76	1.41
New York Central	1.87	1.60	1.66	1.37
New York, Chicago & St. Louis	3.01	2.45	1.76	1.29
New York, Ontario & Western	3.13	2.67	1.48	.95
New York, Susquehanna & Western	4.33	4.02	1.75	1.40
Pere Marquette	3.57	3.15	1.77	1.32
Pittsburgh & Lake Erie	1.96	1.53	1.92	1.37
Pittsburgh & Shawmut	1.80	1.67	1.80	1.67
Pittsburgh & West Virginia	1.71	1.36	1.71	1.36
Pittsburg, Shawmut & Northern	1.81	1.63	1.81	1.63
Wabash	1.91	1.99	1.74	1.50
Central Eastern Region:				
Akron, Canton & Youngstown	2.60	1.99	1.60	1.04
Baltimore & Ohio	1.73	1.17	1.70	1.13
Bessemer & Lake Erie	1.97	1.59	1.89	1.52
Central of New Jersey	3.18	2.93	1.53	1.01
Chicago & Eastern Illinois	1.81	1.73	1.80	1.72
Chicago & Illinois Midland	1.90	1.75	1.90	1.75
Chicago, Indianapolis & Louisville	1.81	1.61	1.81	1.61
Cleve., Cin., Chic. & St. Louis	1.95	1.63	1.77	1.44
Detroit, Toledo & Ironton	2.62	2.26	1.54	1.16
Elgin, Joliet & Eastern	1.75	1.75	1.75	1.75
Illinois Terminal	1.80	1.86	1.78	1.82
Long Island	4.14	3.54	1.84	1.24
Missouri-Illinois	1.53	1.42	1.50	1.36
Pennsylvania system	1.81	1.34	1.78	1.31
Penna.-Read.-Seashore Lines	4.50	3.48	2.32	1.31
Reading	2.82	2.36	1.56	1.11
Staten Island Rapid Transit	4.16	3.58	1.71	1.15
Western Maryland	1.85	1.49	1.84	1.48
Wheeling & Lake Erie	1.83	1.35	1.83	1.35
Pocahontas Region:				
Chesapeake & Ohio	1.75	1.50	1.75	1.50
Norfolk & Western	1.61	1.32	1.61	1.32
Richmond, Fredericksburg & Potomac	3.29	3.15	1.15	.88
Virginian	1.73	1.42	1.73	1.42
Southern Region:				
Alabama Great Southern	1.81	1.44	1.81	1.44
Atlanta & West Point	2.97	2.57	1.77	1.36
Atlanta, Birmingham & Coast	1.98	1.81	1.58	1.39
Atlantic Coast Line	3.00	2.66	1.42	1.07
Central of Georgia	$2.34	$2.01	$2.29	$1.93
Charleston & Western Carolina	2.79	2.47	1.42	1.07
Cin., New Orleans & Tex. Pac	2.04	1.76	1.76	1.47
Clinchfield	1.40	1.06	1.40	1.06
Columbus & Greenville	2.64	2.20	1.58	1.17
Georgia	3.37	2.97	1.54	1.10
Georgia & Florida	3.14	2.79	1.60	1.10
Georgia, Southern & Florida	4.15	3.79	2.04	1.73
Gulf & Ship Island	3.30	3.12	1.41	1.21
Gulf, Mobile & Northern	1.94	1.85	1.22	.97
Illinois Central Lines	1.86	1.72	1.66	1.51
Louisville & Nashville	1.62	1.32	1.62	1.32
Mississippi Central	2.82	2.41	1.30	.86
Mobile & Ohio	1.87	1.69	1.87	1.69
Nashville, Chat. & St. Louis	1.99	1.79	1.92	1.72
New Orleans & Northeastern	3.40	3.10	1.69	1.40
Norfolk Southern	3.07	2.67	1.32	.84
Northern Alabama	1.80	1.44	1.80	1.44
Seaboard Air Line	2.41	2.19	1.28	1.06
Southern	1.62	1.31	1.58	1.26
Tennessee Central	1.72	1.27	1.72	1.27
Northwestern Region:				
Chicago & North Western	1.80	1.86	1.80	1.86
Chicago Great Western	2.53	2.49	1.41	1.33
Chicago, Mil., St. P. & Pacific	2.05	2.00	2.05	2.00
Chicago, St. P., Minn. & Omaha	3.84	3.58	3.28	3.30
Duluth, Missabe & Northern	3.95	4.12	3.95	4.12
Duluth, South Shore & Atlantic	4.10	3.68	4.06	3.66
Duluth, Winnipeg & Pacific	3.87	3.54	3.58	3.24
Great Northern	3.03	2.82	3.03	2.82
Green Bay & Western	3.81	3.91	3.81	3.86
Lake Superior & Ishpeming	3.87	3.77	3.87	3.77
Minneapolis & St. Louis	2.13	2.33	2.10	2.32
Minn., St. P. & Sault Ste. Marie	3.34	3.22	2.91	2.88
Northern Pacific	2.21	2.24	2.20	2.22
Oregon-Washington Navigation Co.	2.61	5.90	2.52	2.63
Spokane International	5.13	5.47	3.26	3.62
Central Western Region:				
Alton	1.84	1.71	1.82	1.70
Atchison, Topeka & Santa Fe	2.55	2.43	2.54	2.41
Chicago, Burlington & Quincy	1.67	1.76	1.62	1.71
Chicago, Rock Island & Pacific (Inc. Chic., R. I. & Gulf)	2.14	2.06	2.01	1.93
Colorado & Southern	2.34	2.18	2.28	2.13
Denver & Rio Grande Western	1.79	1.51	1.78	1.51
Denver & Salt Lake	1.10	.84	1.10	.84
Fort Worth & Denver City	4.37	4.23	2.29	2.14
Los Angeles & Salt Lake	....	3.50	....	3.50
Nevada Northern	4.52	4.50	1.72	1.66
Oregon Short Line	2.64	3.09	2.45	2.37
St. Joseph & Grand Island	3.15	3.09	2.78	2.62
Southern Pacific (Pacific lines)	3.04	3.16	3.04	3.16
Toledo, Peoria & Western	1.51	1.47	1.51	1.42
Union Pacific	2.37	2.33	2.37	2.31
Utah	1.18	1.05	1.18	1.05
Western Pacific	3.17	2.88	1.94	1.63
Southwestern Region:				
Fort Smith & Western	2.68	2.66	2.68	2.66
Kansas City Southern	1.97	1.86	1.95	1.86
Kansas, Oklahoma & Gulf	1.90	1.82	1.52	1.50
Midland Valley	1.49	1.51	1.49	1.51
Missouri & North Arkansas	2.58	2.64	2.21	2.23
Missouri-Kansas-Texas lines	2.53	2.49	2.37	2.32
Missouri Pacific	1.67	1.68	1.67	1.68
Oklahoma City-Ada-Atoka	2.29	2.20	1.89	1.79
St. Louis-San Francisco	1.95	1.74	1.89	1.67
St. Louis Southwestern	2.13	1.88	1.39	1.06



Comparative Rise in the Average Cost of Representative Railway Materials from January, 1933, to December, 1934

in view of the adverse effect of the increases of last year on buying.

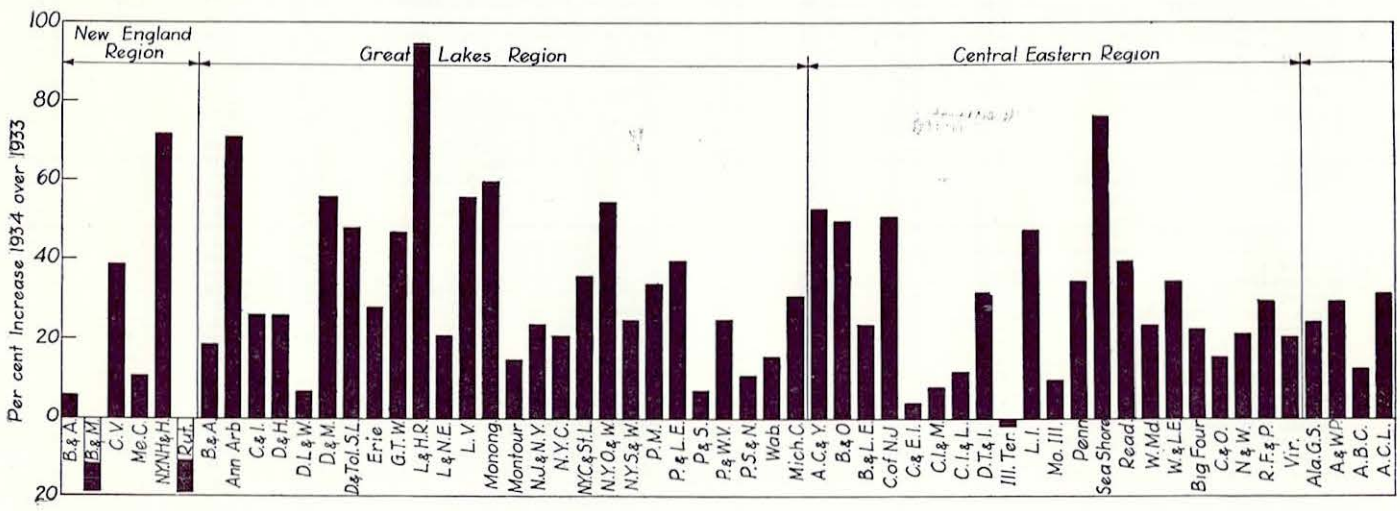
Further Recovery in Scrap Prices

While the roads paid more on the average for iron and steel products, they have benefited proportionately by the higher increases in the prices obtained for the scrap iron they sold. In 1932, scrap iron prices were the lowest recorded, leading many roads to abandon efforts to dispose of it, with the result that the large volume of scrap that has accumulated has continued to weigh heavily on the market. Recently, however, domestic mills resumed the purchase of scrap on a larger scale and the depreciated value of the dollar has produced a large foreign market, as evidenced by the fact that 1,900,000 tons were exported last year, as compared with 781,000 in 1933 and 515,000 in 1929. While most roads received less for the scrap in the last quarter of 1934 than in the first quarter of the year, the average prices obtained by representative roads in various parts of the country of $7.96 a ton for No. 1 wrought, $8.31 for No. 1 melting steel and $8.97 for rolled rail, were 20 per cent, 13 per cent and 13 per cent higher, respectively, than the prices obtained during 1933, and from 35 to 90 per cent above the average prices obtained in 1932. Scrap prices have been rising consistently for several weeks and it is widely held that substantial increases are in prospect this year. Some roads, in fact, are anticipating $13 scrap.

Coal Costs Soar

The advance of 17 per cent in the weighted average unit cost of railroad coal f.o.b. mine for the first 10 months of the year, although doubtless failing to reflect the full effect of the increases made since last spring, was conspicuous both because of the large amount of coal used by the railroads and because most of the roads obtained their requirements throughout 1933 at costs averaging 4 per cent below those prevailing in 1932. This is attributed to the fact that the price agreements for annual requirements in that year were largely made before the codes were introduced and because the coal codes were so long in preparation. With the beginning of the coal year of 1934, a new wage agreement was adopted after a period of controversy attended by serious disorders in the mining sections of the East, which introduced a seven-hour day in the bituminous industry and minimum coal prices were read into the codes. All the railroads have since been paying more for their coal, the increases amounting to 30 and 40 per cent in many cases and more than 75 per cent in some cases, giving many roads much concern. The increases were more pronounced in the Eastern than in the Western territories where coal mining is not so dominant and labor problems similar to those in the East and South are not present.

While the agreement for the seven-hour day expires on March 31, conditions throughout the country, not overlooking the strife prevailing within the coal organizations of Central Illinois, make it appear that the rigors of the agreement may not be lessened, and the fear of legislation imposing further taxes on the industry in one form or another indicates that the cost of coal to some roads may be increased during 1935. So far, the efforts of the Federal Co-ordinator of Transportation to revise the practices of coal buying do not appear to have had any effect on either production or price. Based on 10 months' figures from all roads, as reported to the I.C.C., the average cost of coal, excluding freight, was $1.58

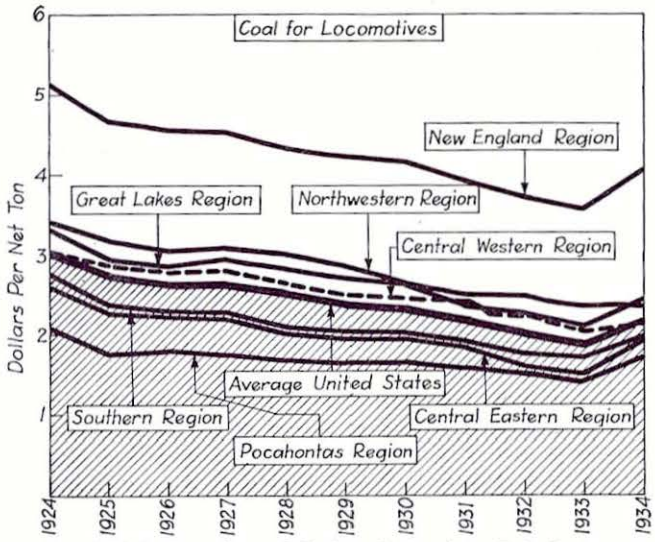


Increase in Average Cost of Coal for Locomotives, First 10 Months of 1934 Over the Corresponding Cost in 1933

a ton in 1934, as compared with $1.37 a ton in 1933. Coal buying at 60 and 80 cents a ton has disappeared and all locomotive coal is now well over the dollar mark.

"Hot Oil" a Factor in Fuel Oil Prices

Fuel oil was another commodity where cost advanced in 1934, after declining in 1933. While the average increase was small on some roads, it was large enough to increase the fuel oil bill for all roads for 12 months collectively by 15 per cent over the average in 1933. Unlike the situation in the coal fields, the increases were primarily the result of heavy curtailment in the supply of fuel oil, resulting from arbitrary restrictions upon the production of crude oil and better control over the production of illegally produced oil, commonly called "hot oil," in the east Texas field. This reduction in the volume of fuel oil was accentuated as refiners, working under restricted allotments of crude oil, proceeded to beat the game by buying up fuel oil and "cracking" the gasoline out of it. Railroads in the producing fields frequently went off their lines to fill their requirements last year. The going prices for the past six months in Oklahoma was 60 cents a bbl., based on $1 for crude oil, and 40 to 50 cents a bbl. in east Texas. Spot oil in other fields cost from 50 cents to $1.05. Taking the country as a whole, the available supply of fuel oil is adequate, but the recent decision of the Supreme Court, outlawing the certain provisions of the code, has not,



Trend of Average Cost of Coal to Railroads in Each Region, Freight Included

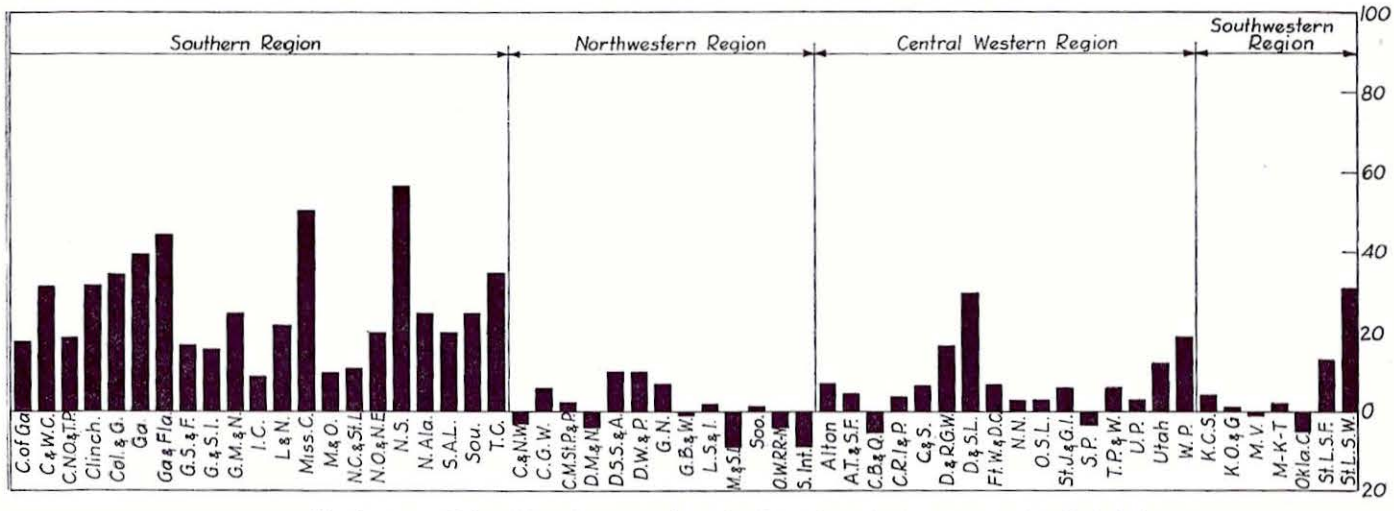
cents to 7 cents a gallon, was fractionally under the cost in January and, in some cases, higher. The average was 11 per cent above that paid in 1933 and 4 per cent below the average paid in 1932. Contrasted with fuel oil, the prices of illuminating oils and lubricants were practically free from fluctuations during the past year and as popularly expected, depressed prices. On the contrary, the code price of crude oil is now up 10 cents a bbl. above that prevailing last year.

Gasoline prices fluctuated during the year and the cost on various roads in December, ranging from 2.88 were unchanged from the prices in 1933. Journal packing, however, which invites attention in any discussion of lubricants, averaged 13 per cent higher than in 1933 and 27 per cent higher than in 1932, although the prices paid on different roads, ranging from 4.5 cents a pound

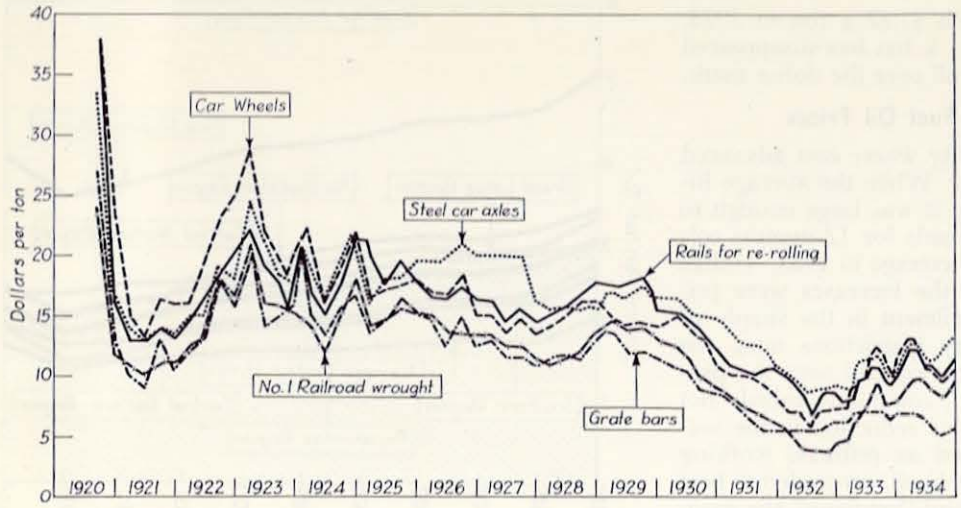
Cost Per Gallon of Fuel Oil for Locomotives—Class I Railroads*

	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents	1934† Cents
Great Lakes Region	5.83	5.98	5.81	5.86	3.81	3.51	4.19	3.90	2.95	3.15	4.66
Central Eastern Region	....	....	....	....	4.17	4.07	3.67	3.54	3.21	3.55	4.14
Eastern District	5.83	5.98	5.81	5.86	3.84	3.55	4.13	3.87	2.97	3.19	4.64
Southern Region	3.57	3.96	3.97	3.97	2.98	2.37	2.21	1.85	1.32	1.64	2.36
Southern District	3.57	3.96	3.97	3.97	2.98	2.37	2.21	1.85	1.32	1.64	2.36
Northwestern Region	2.86	3.32	3.01	3.00	2.94	2.71	2.49	2.12	1.90	1.80	1.97
Central Western Region	2.98	3.23	2.72	2.54	2.37	2.10	1.97	1.82	1.69	1.57	1.70
Southwestern Region	2.44	2.85	3.14	3.03	2.46	1.98	1.89	1.59	1.26	1.07	1.31
Western District	2.75	3.09	2.91	2.78	2.47	2.12	1.99	1.76	1.54	1.40	1.59
United States	2.78	3.13	2.95	2.81	2.48	2.12	2.00	1.77	1.55	1.41	1.61

* Invoice plus freight charges—I. C. C.
† 10 months.



The Increases Were More Pronounced in the East than the West. Freight Excluded



Typical Trends of Scrap Iron Prices

to 9.7 cents, are at present less by 25 per cent than a year ago.

Lumber Costs Higher

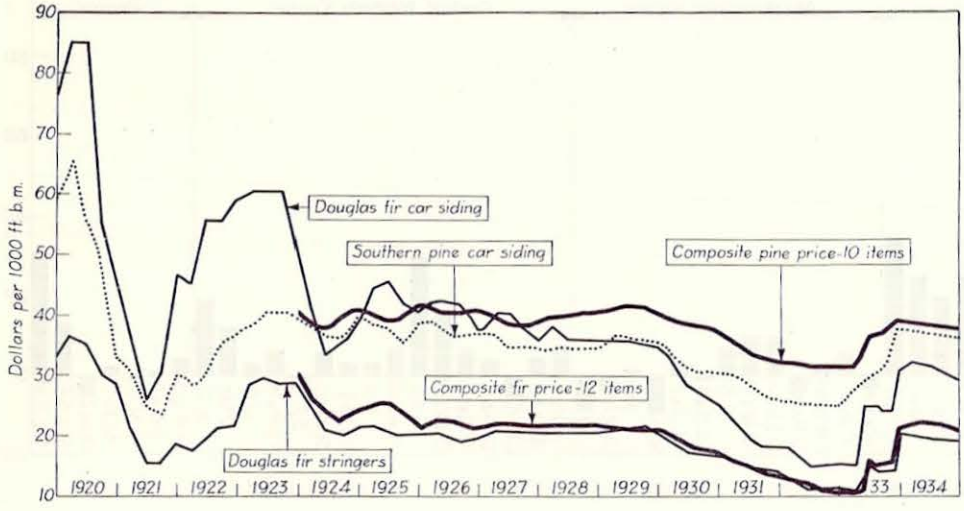
Lumber buying in 1934 involved the payment of equal or higher prices in some transactions than were paid in the previous year for corresponding material and caused increases in the average cost for the 12 months sufficient to double the corresponding cost of some items of lumber purchased in 1932. It is noteworthy, however, that prices, instead of continuing to rise sharply as they did in 1933, immediately prior to and under the operation of the lumber code, declined appreciably and were lower in many instances at the close of last year than 12 months before. Fir car siding that cost $39 in December, 1933, was obtained for $22 in December, 1934; pine lining that cost $65 in December, 1933, was obtained for $57 in December, 1934; and fir timbers that cost $21 in December, 1933, were obtained last fall for $17.50.

Especially in the lumber industry, the year will be recalled as one which saw the rise and fall of minimum prices under the N.R.A. lumber code. The final outcome of this and other provisions intended to control prices and distribution remains to be determined, but price fixing has not proved practical and that part of the code has already been discarded. The prices established by the first minimum price schedule were admittedly higher and downward adjustments in price lists were frequently made during the subsequent period of operation. The market has since fallen to the natural level based on market conditions and those provisions of the code governing production and wages. This level is considerably above that prior to the code and, with a revival of lumber buying that has begun in recent weeks, based on the prospect for increasing consumption during the year, the tendency is toward higher prices.

While little lumber has reached this country from Canada because of the restrictions governing much of the work where lumber is being used in large quantities throughout the country, the ultimate relation of British Columbia forests to those of the Pacific Coast make it interesting to note that lumbering in that region (where prices are half those in Washington) have been pronounced. The business from Australia, the United Kingdom, Japan and Africa increased lumber exports from a total of 633,000,000 bd. ft. in 1933 to 850,000,000 ft. in 1934, caused mills to run double shifts and permitted increases of 15 per cent to be made in wage scales throughout the lumber trade. This situation it particularly significant in view of the fact that it has been accomplished without benefit of large expenditures by the government for public works, and confirms reports of heavy increases in construction work in other parts of the world.

Tie Prices Raise Maintenance Costs

Tie prices last year were influenced by the labor and other provisions in the lumber and tie codes, by large increases in tie buying in the face of limited tie stocks and also by federal relief operations which reduced the incentive for tie production, and it was a foregone conclusion early last year that ties would cost more than



Trend of Prices Paid for Railway Lumber

previously. It does not appear that prices fluctuated as widely during the year as did lumber prices, but the increases were general. Fir cross ties that were purchased for 38 and 65 cents each in 1933 cost 58 cents and 80 cents in 1934. Pine prices increased from 58 cents to 65 cents, from 80 cents to 90 cents and from 45 cents to 58 cents on various roads, while oak ties increased from 50 cents to $1.17, 60 cents to 70 cents, 60 cents to 75 cents, 58 cents to 67 cents, 87 cents to 97 cents, and 84 cents to $1.10. Roughly, this indicates average increases of 35 per cent in fir ties, 10 per cent in pine ties and 15 per cent in oak ties, and increases from 10 to 50 per cent above the 1932 costs.

The ultimate cost of ties to the railroads was further advanced last year by increases in the price of preservatives. The prevailing price of creosote oil, ranging from 9.5 to 12 cents a gallon on various roads, while fluctuating little during the year, shows a 10 per cent increase over the previous 12 months. Tie costs now compare roughly with those in 1931 and, with prospects pointing to further increases in tie renewals this year, it is believed that the possibilities for further increases in tie prices have not been exhausted. On the contrary, prices are advancing noticeably at the present time.

Copper Up

Contrary to the prevailing trends in 1934, lead prices declined during the past year from an average of $4.24 a cwt. in January to $3.81 a cwt. in December, and the average for the year was 3 per cent less than in 1933. Here and there, copper, particularly sheet copper, was also purchased for less in December than in January, but in general, the prices increased during the past year and the average price of 9.39 cents a pound, for journal bearings in 1934 was 15 per cent above the corresponding average in 1933 and 30 per cent higher than was paid in 1932, while the price of copper wire is about double that paid in 1932. It is to be expected that increases in the price of basic copper would be reflected in products requiring considerable copper in their manufacture.

Miscellaneous Prices Mixed

The price of oxygen gas, used for welding and cutting operations, ranged from 60 cents to $1.25 a 100 cu. ft. among different roads and was unchanged from 1933; the same is true of boiler lagging, for which practically all roads paid 15.2 cents a sq. ft. Fire brick, ranging from $40 to $47.50 a thousand, while constant during the year, cost most roads 20 per cent more than in 1933, and cement, ranging from $1.60 to $2.39 per barrel in various parts of the country, is now costing about 8 per cent more than a year ago. Rubber has been increasing from the first of 1933 and the prevailing prices are from 15 to 20 per cent above corresponding prices a year ago, while leather has increased 20 per cent. Neither linseed oil nor white lead, used in paint, has changed materially from the previous year, but glass has declined 20 per cent.

Codes Reduce Competition

In general, railway buying during the past year was marked by sharp reductions in variations between bids for similar material, less competition, and widespread price fixing, and, while no difficulty appears to have been encountered in purchasing material to specifications, trouble was met in securing prompt deliveries from some firms. Whether this condition has been augmented by the inability or failure of railroads to anticipate their requirements in advance of the needs and to buy in quantities necessary to profitable manufacture is a disputed point.

Equipment Prices

ORDERS for rolling stock and motive power in 1934 were again too few, and placed in such small quantities, to draw from their prices any definite conclusions as to the trend of costs. Moreover, the Interstate Commerce Commission, in authorizing P.W.A. loans or the issuance of equipment trust certificates, did not in many cases disclose the unit prices of the equipment involved. Some such prices were made public, however, and in other cases a lump sum was shown for a single class of equipment so that an average cost could be arrived at by dividing the lump sum by the number of units ordered.

The accompanying table sets forth a few of the unit costs of equipment purchased in 1934, obtained in the manner outlined above from reports of the Interstate Commerce Commission, with descriptive details obtained from other sources. Making due allowance for the fragmentary character of these data, they may serve at least to give some indication of price developments during the year.

Partial List of 1934 Equipment Prices

LOCOMOTIVES

Type	Number	Service	Weight	Horsepower or Tractive Force	Unit Cost
4-8-4	10	Psgr.	477,400	69,800 lb.	$122,000
Oil-Elec.	1	Freight	140,000	500 hp.	52,000
4-8-4	5	Fr. & P.	428,000	66,500 lb.	(1)118,000
Oil-Elec.	1	Mixed	140,000	535 hp.	52,000
2-6-6-4	3	Freight	528,040	(2)113,500 lb.	110,500
2-6-6-4	5	Freight	480,000	82,300 lb.	126,194

(1)Price excluding Boosters. (2)Tractive power incl. Booster.

FREIGHT CARS

Kind	Number	Capacity	Construction	Weight	Unit Cost
S. S. Box	250	100,000	Steel	46,500	$2585
Hopper	150	100,000	Steel	40,800	2320
Gondola	100	100,000	St. Underframe	42,700	2180
D. S. Box	300	100,000	Steel	45,200	2283
D. S. Box	700	100,000	Steel	45,900	2260
Phosphate	100	140,000	Steel	50,800	2935
Hopper	6000	100,000	Steel	42,200	2029
Gondola	1000	100,000	Steel	44,500	2012
D. S. Box	500	100,000	Steel	44,400	2300
Auto (1)	350	100,000	Steel	56,400	3179
Auto	150	100,000	Steel	56,400	2813
Box	500	100,000	Steel	46,000	2411
Hopper	750	100,000	Steel	42,500	2008
Hopper	750	100,000	Steel	42,500	1992
Hopper	250	100,000	Steel	42,100	2000
Flat	125	140,000	Steel	51,800	2545
Furniture	100	80,000	Steel	59,800	3346
Cov. Hopper	50	100,000	Steel	45,700	2665
Hopper	200	140,000	Steel	54,800	2800

(1)Equipped with loaders.

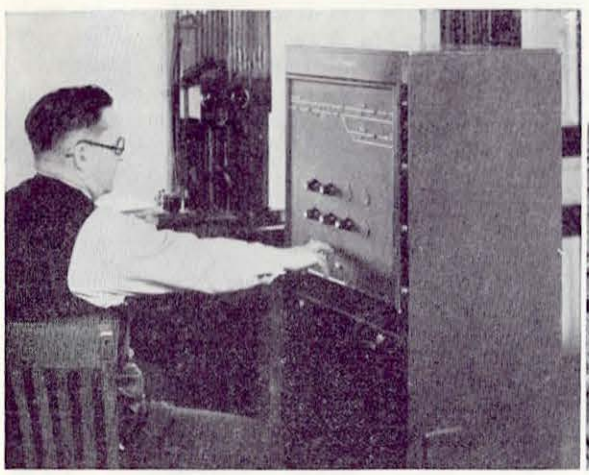
PASSENGER CARS

Kind	Number	Principal Material in Construction	Seating Capacity	Weight	Unit Cost
Semi-thru Coach	50	Steel	88	115,165	$21,495
Suburban Coach	75	Steel	92	108,100	20,098
P. M. & B.	8	Steel	38	124,000	21,013
Coach	15	Steel	..	142,000	23,676
Mail & Exp.	11	Steel	..	140,100	21,525

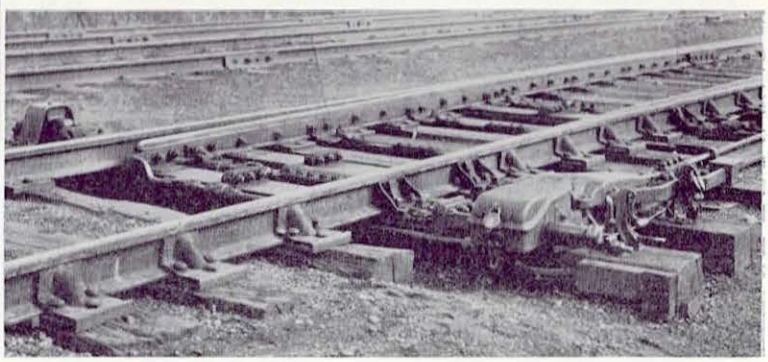
Signaling Construction Limited in 1934

Volume of equipment placed in service slightly less than for any year in last decade—Good prospects for increases

By John H. Dunn
Signaling Editor, Railway Age



C.T.C. Type Machine for Remote Control of Junction on the Lehigh Valley



Introduction of Facing-Point Lock Extended Application of Spring Switches

IN 1934 the total volume of signaling construction in the United States and Canada hit a new low mark for the last 10 years, the equipment placed in service totaling 2,057 units as compared with 3,720 units in 1933, 2,837 in 1932, and a high record of 17,499 units in 1930. However, several facts indicate that signaling construction has hit the bottom and will show a decided increase in the coming year that will be sustained for several years.

The method of comparing the volume of signaling construction which has been used in the *Railway Age* for six years, is based on the arbitrary system of assigning one unit for each automatic block signal, lever of interlocking, highway crossing signal, spring switch, etc.

Comparison of Annual Signaling Construction

Number of Units Completed Each Year	1930	1931	1932	1933	1934
Automatic Block Signals	7,320	3,501	617	1,189	372
Highway Crossing Signals	2,984	2,368	879	1,010	768
Levers of Interlocking	2,707	2,701	611	782	307
Levers Added at Rebuilt Plants	619	162	124	106	433
Levers of Remote and Centralized Control	839	653	93	159	141
Power-Operated Switches in Remote and Centralized Control	607	412	63	67	89
Signals Controlled in Remote and Centralized Control	1,517	883	139	228	198
ignals in Automatic Interlockings	503	410	251	134	152
Spring Switches	152	122	57	42	47
Number of Retarders	98	41	3	3	....
Power Switches in Retarder Yards	153	96	....	....	....
Total	17,499	11,349	2,837	3,720	2,507

This system does not indicate the money value of the equipment installed but it does give a basis for comparing the total amounts of the different classes of equipment placed in service each year.

Automatic Signaling in 1934

Automatic block signaling was placed in service on 164 miles of road during 1934, an increase of 58 miles over that for the previous year. The Boston & Maine was most active, making 20 separate installations totaling 55 miles of road, including 5 miles of single track and 50 miles of multiple track. Of 372 signals installed during the year, 31 were semaphores, 338 were color-light and 3 were position-light. However, this limited volume of new signaling construction does not present an accurate picture of the total materials used during the year because the replacement of obsolescent signaling and the respacing of existing signaling are beginning to form an important part of the construction activities on many roads. For example, during the last three years, the Pennsylvania has entirely rearranged and replaced much of its automatic block signaling and has extended cab signaling on its line between New York and Washington, which is being electrified. Likewise, the Boston & Maine has replaced semaphores with modern color-light signals on extended mileages, and the Southern Pacific has made similar changes on certain territories. Other roads, such as the Milwaukee and the North Western, which are speeding up steam trains, and the Burlington and the Union Pacific which are introducing high-speed light-weight self-propelled trains, are being forced to respace their automatic block signaling, rearrange interlockings and lengthen the control sections for automatic highway-railroad crossing signals.

Interlocking in 1934

The interlocking construction during 1934 included 18 new plants involving 307 levers, as compared with 29 plants including 782 levers in 1933. Of the new plants, 2 were mechanical, 7 electric, 8 electro-pneumatic and 1 electro-mechanical. The largest interlockings installed during 1934 were those on the Pennsylvania-Reading Seashore lines, the electro-pneumatic plant at Atlantic City, N. J., having a 111-lever frame with 84 working levers. At 42 plants which were rebuilt, a total of 433 levers were added, making a total of 740 new levers of interlocking with attendant switches, signals and control equipment installed during 1934. Furthermore, a considerable number of plants not listed in the

table were overhauled, semaphores being replaced by light signals, and electric locking being installed, among other improvements. The track layouts at several plants were changed to reduce curvature and to install longer turnouts and crossovers to permit higher train speeds.

By reason of the economies to be effected, the construction of automatic interlockings continued at a comparatively rapid rate. As an indication that layouts involving more tracks and more complicated track layouts are now being handled by automatic interlockers, the installations made in 1934 included 152 signals for 19 plants as compared with 134 signals in the 19 plants installed during the previous year. In most instances these new automatic plants replaced mechanical interlockings, the savings to be effected by eliminating levermen being sufficient to pay for the changes within one to three years. At other locations, involving crossings or junctions not previously interlocked, the installation of automatic plants has eliminated the necessity for train stops, thus increasing average train speeds sufficiently to justify the expenditures.

Automatic Block Signals Completed During 1934

Road	Location	Miles of Road	Number of Signals	Manufacturer
Alton	South Joliet, Ill., to Plaines	2.5s	6s	G.R.S.
A. T. & S. F.	Oklahoma City, Okla.	4.6s	4s	Union
		9.2d	4c	.....
B. & M.	Tyter (Athol) Mass., to Montague	14.8d	20c	G.R.S.
	Waltham, Mass., to West Concord	10.3d	14c	G.R.S.
	West Concord, Mass., to So. Acton	1.6d	2c	G.R.S.
	So. Acton, Mass., to Maynard	0.7s	1c	G.R.S.
	So. Acton, Mass., to Ayer	9.2d	13c	G.R.S.
	Ayer, Mass., to E. Fitchburg	7.9d	11c	G.R.S.
	Salem, Mass., to Beverly	1.0d	3c	G.R.S.
	Beverly, Mass., to Montserrat	0.5d	1c	G.R.S.
	Baldwin, Mass., to Lowell Jct.	0.7d	1c	G.R.S.
	Ballardvale, Mass., to Lowell Jct.	0.6d	1c	G.R.S.
	Wilmington, Mass., to Wilmington Jct.	1.7s	1c	G.R.S.
	Gardner, Mass. to Heywood	2.3s	2c	G.R.S.
	Harvard, Mass., to Ayer	0.6d	1c	G.R.S.
	Boston, Mass., to E. Somerville	0.3f	4c	Union
	E. Somerville, Mass., to Wellington	0.8d	4c	Union
	Medford Jct., Mass., to Malden	0.7d	2c	Union
	Boston, Mass., to Everett Jct.	0.2d	1c	Union
	Everett, Mass., to Chelsea	0.8d	2c	Union
	Medford Jct., Mass., to Glenwood	0.5s	1c	Union
	Everett Jct., Mass., to West Everett	0.3d	1c	Union
C. N.	Painsed Jct., N. B.	.....	1s	Union
C. & O.	Richmond, Va., to Elko	11.0d	16c	Union
	Tyree, Va., to Lynchburg	2.0d	4c	Union
	Covington, Va., to Jerrys Run	13.0d	13c	Union
	Prince, W. Va., to Stone Cliff	8.0d	12c	Union
	Spring Hill, W. Va., to St. Albans	7.0d	12c	Union
	Sand Hill, Ky., to Broshears	13.0d	20c	Union
D. & R. G. W.	Dotsero, Col.	0.4s	3c	G.R.S.
D. T. & S. S.	Toledo, Ohio	.....	9c	Union
Erie	Ridgewood Jct., N.J., to Suffern, N.Y.	9.0f	36c	Union
I. R. T.	Bowling Green to Brooklyn Bridge	0.9d	13c	Union
	South Ferry to Chambers St.	1.2d	13c	Union
	110th St. to 145th St.	1.8d	32c	Union
K. & I. T.	Louisville, Ky.	0.2s	2c	Peer.
Monongahela		.....	28c	Union
Penna.	Bay View, Md., to Union Crossing	1.1d	2p	Union
	Lawrence Jct., Pa., to Cherry St.	0.9d	1s	Union
		.....	1p	.....
N. Y. R. T.	Grand Ave. to Broadway	2.5d	35c	G.R.S.
S. P. T. & N. O.	Echo Yard, Tex.	1.4s	4s	Union
	Cuero Yard, Tex.	3.7s	3s	Union
W. M.	Hagerstown, Md., to Wingerton, Pa.	6.6d	5s	Union
	Siloam, Pa., to Lurgan	2.9s	7s	Union
		5.7d	..	.....
Totals		20.9s	31s	
		133.9d	338c	
		9.3f	3p	
		164.1	372	

Legend—
In "Miles of Road" column; s = Single track, d = Double track, f = Four tracks.
In "No. of Signals" column; s = Semaphore, c = Color-light p = position-light.

Remote and Centralized Control

In the field of centralized traffic control, including remote control, construction during 1934 included a total of 29 installations involving 141 levers, 89 power switches and 198 controlled signals, as compared with 159 levers, 67 power switches and 228 signals in the previous year. The Boston & Maine made five short C. T. C. installations to close gaps or extend existing territories, while the Pennsylvania completed two C. T. C. projects involving 17 miles of three and four-track lines. The remaining 21 installations listed in the table involved the remote control of outlying switches or signals or the combination of the control of two or more interlocking layouts in one tower. The benefits derived by such changes include reductions in operating expenses, as well as improvement in train operation by reason of the elimination of confusion occasioned by two or more men being involved in establishing routes for trains.

Automatic Interlockings Completed During 1934

Road	Location	No. of Tracks On Reporting Road	No. of Tracks On Other Road	No. of Signals	Manufacturer
C. P.	Komoka, Ont.	1	2	10	.....
	Ringold, Ont.	..	..	10	.....
	Tillsonburg, Ont.	..	..	6	.....
	Bucke, Ont.	..	..	9	.....
	Ft. William, Ont.	2	1	10	.....
C. B. & Q.	Lincoln, Neb.	2	1	10	.....
	Ayres Tower, Ill.	1	1	8	.....
C. R. I. & P.	Gallatin, Mo.	1	1	7	.....
	Tindall, Mo.	..	..	4	.....
M. P. I. G. N.	Houston, Tex.	1	1	7	Union
H. B. & T.	Houston, Tex.	1	1	6	W.R.S. G.R.S.
S. P. T. & N. O.	LaRosen, La.	1	1	8	.....
	Houston, Tex.	1	1	6	Union
T. & P.	Alexandria Jct., La.	2	1	10	G.R.S.
	Dallas, Tex.	2	1	8	G.R.S.
	Paris, Tex.	1	2	13	G.R.S.
U. P. O. W. R. & N.	Parker, Wash.	1	1	8	Union
Virginian	Algren, Va.	1	1	8	.....
Wabash	Moravia, Ia.	1	1	4	Union
Totals, 19 Plants				152	

Spring Switches Used Effectively

The improvements in spring switches and the development of automatically operated facing-point locks

The Use of A.A.R. Standard Flashing Light Crossing Signals with Illuminated STOP Sign Increased in 1934

have provided an incentive to use this means for operating switches at ends-of-double-track, passing sidings and yard leads, where train movements predominate on certain routes. The facing-point lock insures practically the same protection for a main-line switch as is offered by interlocking, so that there is no occasion to reduce train speeds when making main-line movements over a switch so equipped. It is interesting, therefore, to note that spring switches were installed at 47 locations during 1934, as compared with 42 in the previous year, the signaling being arranged to operate automatically or to be controlled remotely to direct train movements. Some roads use special signals, separate from the automatic signals. For example, on the Great Northern, regular signals with the lunar white aspect are used to indicate the normal position of spring switches. On the Central of Georgia, a special color-light-type signal is used to perform the function of a switch target.

Interlocking Plants Completed During 1934

Road	Location	Manufacturer	Lever Capacity of frame	Working Levers: Mechanical	Electric	Electro Pneumatic	Elec.-Mech.: Mech.	Elec.-Mech.: Elec.
B. & O.	New Castle, Pa.*		8	8	..	..	..	..
B. & M.	Boston Tower—A*	Union	..	..	..	15	..	..
	Boston Tower—C*	Union	..	..	..	21	..	..
	Ayer, Mass.*		..	..	..	1	..	..
	Wellington, Mass.	Union	8	..	6	..	..	..
	Everett, Mass.	Union	8	..	6	..	..	..
	Gardner, Mass.*	G.R.S.	..	..	11	..	..	..
C. N.	Montreal, Que.		24	21	..	..	..	..
C. P.	Delson, Que.		16	..	14†	..	..	..
	Outremont, Que.		..	..	11†	..	..	..
C. R. R. of N. J.	Elizabeth, N. J.*	Union	8	..	..	..	..	5
C. & O.	Richmond, Va.*	Union	..	..	..	..	..	..
	Moss Run, Va.*	Union	..	..	..	..	..	..
	Alderson, W. Va.*	Union	..	..	..	..	3	..
	Gauley, W. Va.*	Union	..	..	..	..	..	4
	Cabin Creek Jct., W. Va.*	Union	..	..	..	..	..	..
	Riverton, Ky.*	Union	16	16	..	..	..	..
C. & E. I.	Alvin, Ill.*		..	..	..	..	..	..
	Salem, Ill.*		..	..	..	..	..	..
C. B. & Q.	Crawford, Wis.*		..	..	..	..	..	..
	Galena Jct., Ill.*		..	..	..	..	..	..
	Burlington, Ia.*		..	..	..	..	..	..
C. M. St. P. & P.	Ebner, Ill.*		..	..	..	..	..	..
	Watertown, Wis.	Union	..	..	3	..	..	..
C. R. T.	Chicago, Ill.*	Union	19	..	..	18	..	..
D. L. & W.	Secaucus, N. J.*		..	..	..	..	..	..
	Chester Jct., N. J.*		..	..	..	..	..	..
	Binghamton, N. Y.*		..	..	..	..	..	..
E. J. & E.	Joliet, Ill.	G.R.S.	16	..	12	..	..	..
Erie	Waldwick, N. J.*	Union	..	..	..	..	..	..
	Leavittsburg, Ohio*	Union	..	..	..	..	..	..
L. S. & I.	Marquette, Mich.*		..	..	..	..	..	..
L. V.	Manchester, N. Y.*		..	..	..	..	..	..
M. P.	Houston, Tex.*	W.R.S. G.R.S.	..	..	1	..	..	..
M. Con. Co.	Cromwell, Ala	Union	2	2	..	..	..	..
Newark	Norfolk Street	Union	3	..	..	3	..	..
City of	Warren Street	Union	3	..	..	3	..	..
	Broad Street	Union	5	..	..	5	..	..
N. Y. C.	Beacon, N. Y.*	G.R.S.	..	..	..	..	1	..
	Rensselaer, N. Y.*	G.R.S.	..	..	..	..	..	..
	South Bend, Ind.*	G.R.S.	..	..	26	..	..	..
Penna	W. Newark Jct., N. J.*	Union	..	..	..	12	..	..
	Harsimus Cove, N. J.*	Union	..	..	..	..	..	..
	Altoona, Pa.*	Union	..	..	..	20	..	..
	Bowie, Md.*		..	..	..	10	..	..
	Camden, N. J. "Alan"*	Union	75	..	..	62	..	..
	Camden, N. J. "Center"	Union	63	..	..	52	..	..
	Allen Lane, Pa.		..	..	6	..	..	..
	Bay View, Md.*	Union	51	..	..	28	..	..
	Baltimore, B. & P. Jct.*	Union	107	..	..	80	..	..
	Baltimore Union Jct.*	Union	95	..	..	77	..	..
	Kiskiminetas, Pa.	Union	..	..	..	24	..	..
	Ashtabula, Ohio*		..	..	..	..	..	..
	Struthers, Ohio*	G.R.S.	..	..	7	..	..	..
	Whiting, Ind.*	Union	..	..	..	..	2	..
Penna.-Read	Winslow Jct., N. J.	Union	1	..	..	23	..	..
S. S. L.	Atlantic City, N. J.	Union	111	..	..	84	..	..
	Camden "Brown" Union	Union	35	..	..	27	..	..
St. L.-S. F.	Vernon, Tex.*	Union	8	5	..	..	..	..
U. S. Gov.	Mud Bayou, La.	G.R.S.	..	..	..	..	3	2
Totals: Levers	New			23	58	221	3	2
	Added			29	45	344	6	9

	Plants	Levers
New	18	307
Rebuilt	42	433
		740

Legend:

* Existing plant at which additional levers were added and in many cases entire plant rebuilt.

Highway Crossing Protection

Automatically-controlled highway-railroad crossing protection was placed in service during 1934 at 392 crossings, using 159 wig-wags, 505 flashing-light signals, 75 rotating disk signals with flashing-lights, 29 traffic-type signs and 28 gates. The use of explanatory "Stop" signs on crossing signals, as recommended by the A. A. R. Joint Committee on Highway Crossing Protection, received increased attention during the year. The automatically controlled "Stop" sign was installed on 75 signals, and the "Stop on Red Signal" reflector-button type sign on 214 signals. In addition, several roads installed signs on existing signals, including 132 signs on the Delaware, Lackawanna & Western, 577 signs on the New York Central and 38 on the New York, Chicago & St. Louis. The Erie installed 230 reflector-button type approach warning signs on highways approaching its tracks, and also 18 reflector-button type crossbuck signs. The Grand Trunk Western installed an automatically-controlled barrier-type protection at one crossing in Indiana.

During 1934, thirteen states appropriated portions of their P. W. A. funds for the installation of highway-railroad crossing signals, a total of more than a million dollars being set aside for the protection of 464 crossings. North Carolina spent $250,000 for signals at 86 cross-

Highway Grade Crossing Protection Installed in 1934

Road	No. of Crossings Protected	No. of Wig-Wag Signals	No. of Flashing-Light Signals	No. of Rotating Stop Sign Signals with Flashing Lights	No. of Traffic Type Stop and Go Signals	No. of Electrical Operated Gates
Alton	1	..	2	..	..	..
A. T. & S. F.	22	40	4†	..	..	..
B. & O.	7	..	18	..	..	..
B. & M.	3	..	5	..	..	..
	1	..	2†	..	..	..
C. N.	11	13	..	..	..	..
G. T. W.	3	..	2†	..	..	..
C. P.	5	12	..	..	..	..
	1	2*	..	..	..	..
C. & O.	2	..	5†	..	..	..
	6	..	16	..	..	..
C. & E. I.	2	..	2	..	..	..
	..	..	2†	..	..	..
C. & N. W.	12	24	..	..	..	..
	3	..	6	..	..	..
	3	..	..	6	..	..
C. B. & Q.	5	..	10	..	..	..
	1	1	..	..	..	..
	1	..	..	2	..	..
	1	..	..	..	..	4
C. G. W.	1	..	..	2	..	..
C. I. & L.	2	..	2*	..	..	..
C. M. St. P. & P.	16	..	..	31	..	..
	4	6	..	..	..	..
C. R. I. & P.	1	..	2†	..	..	..
C. St. P. M. & O.	6	..	..	12	..	..
C. S. S. & S. B.	3	..	1	..	2	..
	1	..	1*	..	..	..
D. & H.	3	..	6†	..	..	..
D. L. & W.	3	..	..	..	6	..
	1	..	1	..	..	..
	1	..	4†	..	..	..
D. & R. G. W.	1	..	1*	..	..	..
	2	..	2†	..	..	..
E. J. & E.	2	..	4*	..	..	..
Erie	20	4	37†	..	..	..
F. E. C.	1	..	2	..	..	..
G. N.	4	..	..	8	..	..
I. C.	1	..	2	..	..	..
	2	..	4†	..	..	..
	3	..	..	..	..	12
I. T.	1	..	1	..	..	..
K. & I. T.	5	..	10	..	..	..
L. & N. E.	3	..	6†	..	..	..
L. V.	1	..	4	..	..	..
L. & N.	5	..	..	..	..	12
	1	1	..	..	..	..
	1	..	2	..	..	..
Me. C.	4	..	9	..	..	..
	1	..	2†	..	..	..
M. & St. L.	1	..	..	..	1	..
M. St. P. & S. Ste. M	3	..	2	4	..	..
D. S. S. & A.	1	..	2†	..	..	..

Road	No. of Crossings Protected	No. of Wig-Wag Signals	No. of Flashing-Light Lights	No. of Rotating Stop Sign Signals with Flashing Lights	No. of Traffic Type Stop and Go Signals	No. of Electrical Operated Gates
M-K-T	5	..	6*	..	..	..
	..	..	4†	..	..	..
M. P.	6	..	11*	..	..	..
	1	..	2†	..	..	..
I. G. N.	2	..	4*	..	..	..
St. L. B. & M.	1	..	2*	..	..	..
M. P. of N.	2	..	4*	..	..	..
Monongahela	1	..	2†	..	..	..
N. C. & St. L.	1	..	2†	..	..	..
N. Y. C.	9	..	18†	..	..	..
C. C. C. & St. L.	5	..	10*	..	..	..
	2	..	4	..	..	..
M. C.	13	4	9†	..	..	..
P. & E.	3	..	3	..	..	..
Rutland	3	..	3†	..	..	..
N. Y. C. & St. L.	1	..	2*	..	..	..
	2	..	4	..	..	..
	2	..	4†	..	..	..
N. Y. N. H. & H.	14	..	28	..	..	..
N. Y. O. & W.	2	..	5†	..	..	..
N. & W.	3	6†	..	..	..	..
N. P.	5	1	10	..	..	..
N. W. P.	3	3	..	..	..	..
P. E.	6	10	2†	..	..	..
Penna	40	..	49	..	..	..
	..	..	24*	..	..	..
	..	..	46†	..	..	..
P. R. & S.	5	..	19	..	..	..
P. & P. U.	2	..	4	..	..	..
P. & M.	9	10	7†	..	..	..
Reading	2	..	4†	..	..	..
	1	..	2	..	..	..
St. L.-S. F.	2	..	2†	..	..	..
	2	..	2*	..	..	..
S. D. & A. E.	1	2	..	..	..	..
S. A. L.	1	..	2†	..	..	..
S. P.	11	9	..	8	2	..
T. & N. O.	9	1	2†	..	17	..
T. & P.	1	..	2	..	..	..
U. P.						
L. A. & S. L.	3	1	2†	2	..	..
O. S. L.	2	2	..	..	..	..
O. W. R. & N.	3	4	..	..	1	..
Virginian	1	2	..	..	..	..
W. M.	9	..	18†	..	..	..
W. P.	1	1	..	..	..	..
	392	159	214†	75	29	28
			73*			
			218			
			505			

Legend:

* New A. A. R. automatically-controlled illuminated STOP sign used in conjunction with regular wig-wag or flashing-light signal.

† New A. A. R. button-type reflector sign reading "Stop on Red Signal" used in conjunction with regular wig-wag or flashing-light signal.

ings and Illinois has a program under way to install signals at 297 crossings at a cost of $475,000. Numerous other states are investigating the use of signals to protect crossings at which the expense of grade separation is not justified. Therefore, it is expected that an extensive program of installing grade crossing signals will be carried on during 1935.

Train Control and Cab Signaling

During the year 1934, activities in the automatic train control and cab signal field have been limited. One road, the Chicago, Milwaukee, St. Paul & Pacific, was granted permission to use continuously-controlled cab signals, while petitions presented by two roads, the Alton, and the Pittsburgh & Lake Erie, for the removal of automatic train control were denied. No applications to remove train control or to change to cab signals are now pending before the Interstate Commerce Commission.

The original order involved 49 carriers, 5 of which were later exempted or had the date for completion indefinitely suspended before actual installation was started. At the present time, 23 of the remaining 44 carriers have retained the installations made under the orders of the commission. Two others, the Rock Island and the Southern Pacific, have removed part of their installations, and one, the Central of New Jersey, has changed its second territory to cab signals, while still operating by train control on the first section, although permission was granted to operate by means of cab signals on both orders. Nine roads, including the Jersey Central, have changed to cab signals and 10 roads have been permitted to remove either all or a portion of their installations from service until further order from the commission.

The year has witnessed several interesting developments in interchangeable operation in actual service. Among these are:

1. Operation of Central of New Jersey locomotives over the two-element three-indication type of continuous cab signal system employed on its first order installation and also over the continuous coded four-indication cab signal installation on the Pennsylvania-Reading Seashore Lines, as well as over a similar installation on its own second order territory.

2. Operation of Lehigh Valley gas-electric motor cars, equipped with a four-indication coded cab signal device manufactured by one company, over that part of the cab signal installation on the Pennsylvania between Newark, N. J., and Jersey City, manufactured by a different company and also over its own installation of the intermittent inductive inert track element type of automatic stop.

3. Operation of Baltimore & Ohio locomotives, equipped with an intermittent inductive inert-element type of automatic stop, over Pittsburgh & Lake Erie tracks, upon which is installed a similar device manufactured by another company and utilizing different locations for the track and locomotive receiving elements.

4. Tests with the New Union Pacific high-speed six-car train, which is equipped for operation over the two-speed train control installation on the Chicago & North Western, as well as over the cab signal territory on the Union Pacific. This is the first instance of interchangeable operation over both speed control and cab signal installations.

Spring Switches Installed During 1934

Road	Location	Number
A. T. & S. F.	Taiban, N. M.	2
	Duoro, N. M.	2
	Pedernal, N. M.	2
	Lucy, N. M.	2
	Scholle, N. M.	2
	Chapelle, N. M.	1
B. & M.	Salem, Mass.	1
	Medford Jct., Mass.	1
	Everett Jct., Mass.	2
	No. Chelmsford, Mass.	1
C. & O.	Newport News, Va.	1
	Strathmore, Va.	1
	Craigsville, Va.	1
	North Mountain, Va.	1
	Clifton Forge, Va.	1
	Peru, Ind.	2
C. B. & Q.	Ayres Tower, Ill.	1
C. M. St. P. & P.	Davenport, Ia.	1
	Melbourne, Ia.	1
	Rhodes, Ia.	1
	Hazeltine, Minn.	1
	Wegdahl, Minn.	1
	Minnesota Falls, Minn.	1
	Bristol, S. D.	1
	Groton, S. D.	1
C. R. I. & P.	Tindall, Mo.	1
L. & N.	Bowling Green, Ky.	2
	Louisville, Ky.	1
Me. C.	Hermon Pond, Me.	1
	Portland, Me.	1
M. P.	Danley Jct., Ill.	1
Penna.	Whiting, Ind.	1
S. P.	Springfield Jct., Ore.	1
T. & N. O.	Harvey, La.	1
T. & P.	Alexandria, La.	3
U. P.	Carden, Kan.	1
W. M.	Baltimore, Md.	1
Total		47

As to the Future

Several facts lead to the prediction that signaling construction will increase rapidly in 1935 and continue to grow for several years. It must be remembered that signaling construction continued on a large scale after the depression started in 1929; in fact, construction in 1930, involving 17,499 units, exceeded all past records. This activity was due in part to the fact that numerous major projects that had been planned in 1928 and 1929,

were carried to completion as a logical procedure, regardless of the financial condition of the country as a whole. In the meantime, from 1929 to and including 1934, comparatively few major projects were started, and construction activities were confined primarily to those installations which were necessary from the standpoint of safety or which showed promise of decided savings in operating expenses. Even projects in the latter classification were limited in number during the year just closed because of the pressure from Washington to make no changes which would reduce the number of men employed below certain levels. As a result, new construction during 1934 dropped decidedly in comparison with that of the year previous and with past records. An even less favorable picture is revealed with respect to the new materials purchased from manufacturers during 1934, for the railroads have been "robbing Peter to pay Paul" in many instances to get material for the few installations which were being made. Stocks of material that are ordinarily held as safety protection, have been so depleted that storehouses are stripped and in certain instances some of the equipment has been removed from interlockings which have been taken out of service temporarily.

These facts explain the low volume of signaling construction during 1934; they also point to a rapid increase in activity in this field when general business conditions improve. Plans are now in the files of a number of railways for numerous installations which will effect annual savings of 50 per cent or more of the money required. In addition to their economic justification, many such installations are required to facilitate train movements, which is an important factor especially on lines where both passenger and freight schedules are being shortened. In order to meet this requirement, centralized traffic control must be provided and existing automatic signaling respaced to allow for longer braking distances, while on main-line heavy-traffic territories subject to storms and fogs, cab signaling will be required to insure safety and on-time train performance. Furthermore, as freight traffic increases, yard delays, heretofore accepted as inevitable, will be overcome by the installation of power switches and retarders. Thus there is every evidence that signaling construction will increase because in many instances the installation of modern signal facilities offers the most economical means of increasing average train speeds.

Remote and Centralized Control Installations Completed During 1934

Road	Location	Miles of Road	Manufacturer	Number of Levers: Desk Type	C.T.C. Type	Power Operated Switches	Number of Signals Controlled
Alton	South Joliet, Ill., to Plaines	2.5s	G.R.S.	2	..	..	6
B. & M.	West Concord, Mass.	1.6d	G.R.S.	..	9	..	8
	So. Acton, Mass.	1.6d	G.R.S.	..	4	3	5
	Salem, Mass., to Beverly	0.5s 1.7d	G.R.S. G.R.S.	12	..	8	13
	Medford Jct., Mass.	0.7d	Union	..	..	7	8
	Everett Jct., Mass.	0.1s 1.2d	Union	..	..	6 ..	8 ..
C. & O.	Clifton Forge, Va., to Steele	2.0d	Union	..	10	6	9
	Macdougal, W. Va.	.....	Union	7*	..	2	4
C. & E. I.	Clinton, Ind.	.....	.....	..	..	..	4
	Otter Creek Jct., Ind.	.....	.....	..	..	1*	4
C. B. & Q.	Wataga, Ill.	2.5d	Union	2	..	1	4
C. M. St. P. & P.	Austin, Minn., to Ramsey	2.7s	Union	..	3	..	6
D., L. & W.	Binghamton, N. Y., to East End	.....	.....	3*	..	..	4
M. P. I.-G. N.	Houston, Tex.	.....	G.R.S.	..	..	2	4
Penna.	Winans, Md., to Gwynns Run	4.3t	Union	..	10	5	7
	North East, Md., to Davis	12.5f	Union	..	13	6	3
	Severn, Md.	.....	Union	2*	..	1	3
	North Point, Md.	.....	Union	7*	..	7	9
	Fourteenth Street, D. C.	.....	Union	6*	..	5	9
	East End, Pa.	.....	Union	2	..	1	3
	Franklin Ave., Pa.	.....	Union	6	..	4	8
	Sand, Pa.	.....	Union	4	..	1	6
	Canton Jct., Md.	.....	Union	11*	..	8	17
	Horn-Sunbury, Pa.	.....	Union	2*	..	1	3
	Biddle Street, Md.	.....	Union	12*	..	8	19
	Cross Cut, Pa., to Lawrence Jct.	0.9d	Union	1*	..	3	6
	Farmdale, Ill.	.....	Union	4*	..	1	5
St. L.-S. F.	Ft. Scott, Kan., to Edward	4.1d	Union	3	..	1	5
T. & P.	Alexandria, La.	.....	G.R.S.	..	6	1	8
	Totals	5.8s 16.3d 4.3t 12.5f 38.9	.....	86	55	89	198

Legend:

In "Miles of Road" column: s = Single track. d = Double track. t = Three tracks. f = Four tracks.

*Levers used in existing interlocking machines.

Railway Construction

(*Continued from page 141*)

nect line bought from Southern Pacific between Yulupa, Cal., and Los Guillicos (completed).

Spokane, Portland & Seattle

Important Work Undertaken: Construction of 2,000,000-bu. concrete elevator, including a 100,000-bu. sacking warehouse and timber dock equipped with marine leg, Vancouver, Wash., $1,200,000 (completed). Relocation of 4.49 miles of line to bring tracks above water in Bonneville reservoir, North Bonneville, Wash., $350,000, work being done by the Public Works Administration in connection with the Bonneville dam (completed).

Union Pacific

Important Work Undertaken: Reconstruction of 586 ft. of Tenth street viaduct, Omaha, Neb., $230,800 (completed). Construction of 500-ton locomotive coaling and sanding plant, submerged cinder pits and gantry crane, Green River, Wyo., $133,100 (completed).

(Oregon Short Line.) Subway to replace viaduct, Center street, Pocatello, Idaho, O. S. L. proportion $141,500 (completed).

United States—Bureau of Reclamation

Important Work Undertaken: Construction of line from Odair, Wash., to site of Grand Coulee dam, 28.5 miles.

United States—Public Works Administration

Important Work Undertaken: Construction of line from Wiota, Mont., to site of Ft. Peck dam, 14 miles.

Construction in Canada and Mexico

Canadian National

First Track: At McLure, B. C., 0.69 miles.

Important Work Undertaken: Construction of concourse under station tracks, London, Ont. (to be completed in 1935). Grade separation, Richmond and Wellington streets, London, Ont. (to be completed in 1935). Line diversion, McLure, B. C. (completed).

Pacific Great Eastern

Important Work Undertaken: Line diversion, M. P. 284.5 to M. P. 285.1, British Columbia, 0.6 miles (completed). Line diversion, M. P. 343.4 to M. P. 343.6, British Columbia, 0.2 miles (completed).

Toronto, Hamilton & Buffalo

Important Work Undertaken: Reconstruction and widening of subway, St. Catharines street, Kings Highway 20, Smithville, Ont. (completed).

National Railways of Mexico

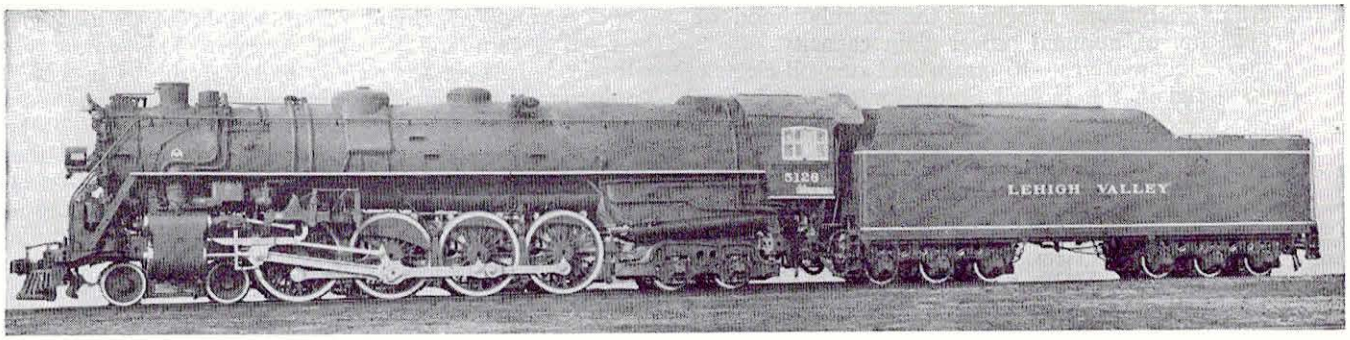
Important Work Undertaken: New freight yard and station, Mexico City (30 per cent completed).

(New lines under construction) Santa Catarina to Apatzingan, 78.57 miles (7 per cent completed). Suchil to Las Charcas, 74.56 miles (0.5 per cent completed). Mexico-Tampico Short Line, 333.7 miles (23 per cent completed, 50.2 miles in operation—work suspended for the present). Gulf Coast Line, Tampico to Vera Cruz, 312.8 miles (16.7 per cent completed, 48 miles in operation—work suspended for the present).

(New lines authorized) Empalme de el Oro to Sierra Mojada. San Carlos to Villa Acuña. El Salto to Mazatlan (Durango to Mazatlan extension).

(New lines under survey) Soledad to Puerto de Tuxpan (location completed).

New Lines Projected: Sierra Mojada to Jimenez. Zacatecas and Berriozabal to La Honda. Rosario to Inde. Inde to Descubridora. Inde to Tepehuanes. Tepehuanes to Guanacevi. Mogoñe to Campeche. Balsas to Acapulco. Tehuacan and Tezonapa to Rio Blanco. Balsas to Zihuatanejo. Coapa to Coyuca. Ejutla to Puerto Angel. Tlacolula to Tehuantepec.



Lehigh Valley 4-8-4 Type General Purpose Locomotive Built in 1934 by Baldwin Locomotive Works—Driving Wheels are 77 in. in Diameter

Locomotives Ordered in 1934

Domestic total of 183 represents more than three times the combined business of two preceding years

By Walter J. Taft
Associate Editor, Railway Age

LOCOMOTIVES ordered during 1934 for domestic service in the United States totaled 183—more than three times the combined figures of 1932 and 1933 and 7 locomotives in excess of the 1931 total which recent data have caused to be revised downward from 235 to 176. Last year was therefore the best which locomotive markets have experienced since 1930 when 440 locomotives were ordered.

But while the improved situation reflected in the foregoing comparison of 1934 with years immediately preceding is distinctly encouraging it nevertheless still leaves locomotive builders a long ways from the volume of business which they enjoyed in pre-depression years. The 1934 total was less than half of the 1930 business which latter in turn was but little more than one-third of the 1929 volume as measured in units ordered. As stated above the 1931 domestic figure has been revised downward from 235 to 176 in the accompanying Table II. This is due to the fact that orders for 59 electric locomotives placed in that year by the Pennsylvania with its own shops were not executed and have now been supplanted by new company shop orders placed during last year.

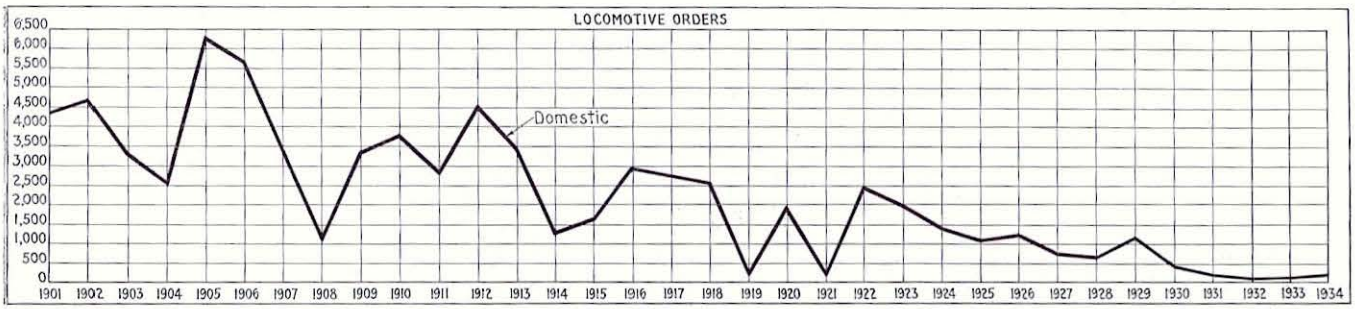
The 1934 orders included 72 steam locomotives, 76 electrics and 35 of the oil-electric, gasoline-electric, oil-mechanical and gasoline-mechanical types. The combined Pennsylvania orders were the largest of the year, involving, as they did, 73 electric locomotives.

It is interesting to note that the growing urge to shorten passenger-train schedules inspired by the popular enthusiasm for the spectacular speed performances of Union Pacific and Burlington Diesel-electric trains is reflected in one order for steam locomotives—that of the Chicago, Milwaukee, St. Paul & Pacific.

Table I—Locomotive Orders in 1934

For service in the United States	183
For export to other countries	17
For service in Canada	..
Grand total	200

Aside from the fact that these locomotives are to be carefully cowled and shrouded to reduce air resistance, they will include no startling innovations in steam locomotive design or proportions. With the steam locomotive, as with other forms of motive power, given a design intended for high speeds, the ability of the locomotive to maintain schedules depends upon the weight of the train it is called upon to pull. Some of the finest trains in America, maintaining average schedules over long distances approaching 50 m. p. h., weigh from 600 to 800 lb. per hp. of maximum locomotive capacity. The high-



Locomotive Orders From 1901 to 1934

speed articulated trains weigh in the neighborhood of 350 lb. per hp. of nominal power-plant capacity.

Seventeen locomotives—16 steam and one oil-electric—were ordered in the United States for export during 1934. Business in this connection was therefore twice that of the two preceding years combined, being at the highest level since 1931 when export orders for 28 locomotives were reported.

Table II—Orders for Locomotives Since 1901

Domestic Orders Only

Year	Locomotives	Year	Locomotives
1901	4,340	1908	1,182
1902	4,665	1909	3,350
1903	3,283	1910	3,787
1904	2,538	1911	2,850
1905	6,265	1912	4,515
1906	5,642	1913	3,467
1907	3,482	1914	1,265

Domestic and Foreign

Year	Domestic	Canadian	U. S. Export	Total
1915	1,612	...	850	2,462
1916	2,910	...	2,983	5,893
1917	2,704	...	3,438	6,142
1918	2,593	209	2,086	4,888
1919	214	58	898	1,170
1920	1,998	189	718	2,905
1921	239	35	546	820
1922	2,600	68	131	2,799
1923	1,944	82	116	2,142
1924	1,413	71	142	1,626
1925	1,055	10	209	1,274
1926	1,301	61	180	1,542
1927	734	58	54	846
1928	603	98	27	728
1929	1,212	77	106	1,395
1930	440	95	20	555
1931	176	2	28	206
1932	12	1 (Export)	1	14
1933	42	...	7	49
1934	183	...	17	200

Prior to 1918, Canadian orders included under "Domestic."

For the third successive year no locomotive orders were placed by Canadian railroads with builders in that country. These Canadian builders have received orders for only 3 locomotives since 1930—two in 1931 and one, an export order, in 1932. In 1930 orders were placed in Canada for 95 locomotives, and 77 were ordered there in 1929.

Locomotives built in 1934 for service in the United States, as distinguished from those ordered, totaled 91 as compared with 57 in 1933 and 102 in 1932. The 1934 total included 62 steam locomotives, 14 electrics and 15 of other types. Production in the United States for export during 1934 involved the building of 19 locomotives—17 steam and two oil-electrics. This compares with six built here for export in 1933 and 18 in 1932. No locomotives were built in Canada either last year or in 1933; three were built there in 1932 and 24 in 1931.

The distinction between locomotives ordered and the number built should be emphasized. A locomotive is under construction for several months and thus locomotive production figures for any year naturally include some units which were ordered during the closing months of the year previous to that under review. It is this overlap from year to year that results in a total production figure different from the total ordered. Also, while the factor has been unimportant in the depression years it should nevertheless again be pointed out, to those comparing the more recent with the more remote years listed in the accompanying tabulation, that modern locomotives are far more powerful and far more costly than

Table III—Locomotives Built in 1934

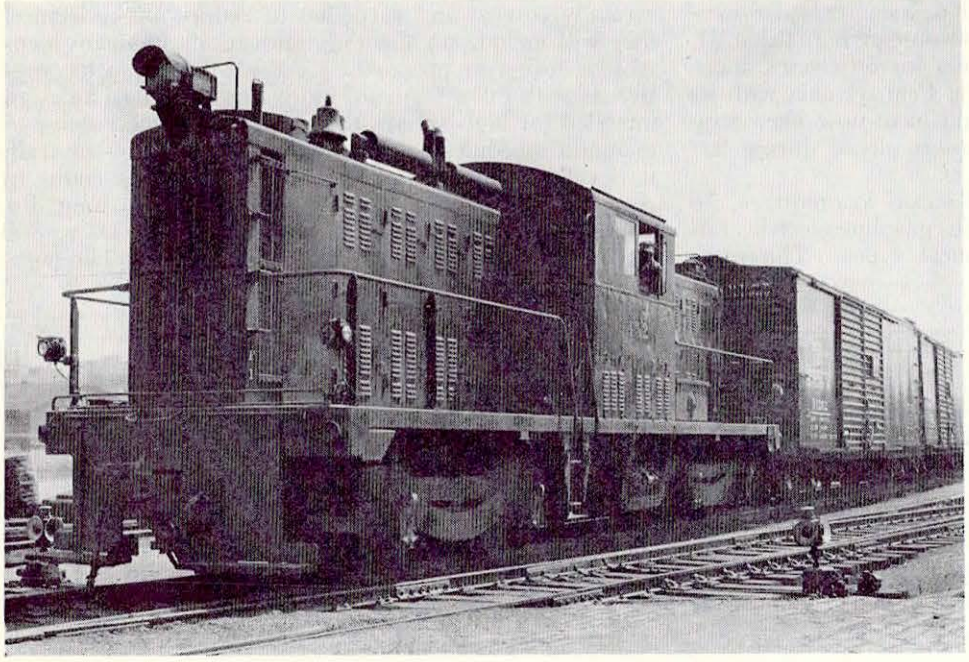
	United States	Canada	Total
Domestic	91	..	91
Foreign	19	..	19
Total	110	..	110

Comparison with Previous Years

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1896	866	309	1,175	1913†	4,561	771	5,332
1897	865	386	1,251	1914†	1,962	273	2,235
1898	1,321	554	1,875	1915†	1,250	835	2,085
1899	1,961	514	2,475	1916†	2,708	1,367	4,075
1900	2,648	505	3,153	1917†	2,585	2,861	5,446
1901	....	...	3,384	1918†	3,668	2,807	6,475
1902	....	...	4,070	1919†	2,162	1,110	3,272
1903	....	...	5,152	1920†	2,022	1,650	3,672
1904	....	...	3,441	1921†	1,185	638	1,823
1905*	4,896	595	5,491	1922†	1,303	231	1,534
1906*	6,232	720	6,952	1923†	3,505	280	3,785
1907*	6,564	798	7,362	1924†	1,810	226	2,036
1908*	1,886	456	2,342	1925†	994	291	1,285
1909*	2,596	291	2,887	1926†	1,585	185	1,770
1910*	4,441	314	4,755	1927†	1,009	167	1,176
1911*	3,143	387	3,530	1928†	636	111	747
1912†	4,403	512	4,915				

*Includes Canadian output.
†Includes Canadian output and equipment built in railroad shops.

	United States			Canada			Grand total
	Domestic	Foreign	Total	Domestic	Foreign	Total	
1929	926	139	1,065	96	..	96	1,161
1930	972	51	1,023	111	..	111	1,134
1931	181	17	198	24	..	24	222
1932	102	18	120	2	1	3	123
1933	57	6	63	..	..	..	63
1934	91	19	110	..	..	..	110



One of the 14 Diesel-Electric Switching Locomotives Placed in Service by the Lackawanna during 1934. The Locomotive Shown, One of Six Built by General Electric-Ingersoll-Rand, Has Two 300-Hp. Diesel Engines and Is in Heavy Switching Service at Buffalo, N. Y.

those of the days when yearly orders totaled thousands.

The Car Service Division of the Association of American Railroads reports monthly totals of locomotive installations and retirements. These figures will not agree with the *Railway Age* totals of locomotives ordered or built, because the Car Service Division total covers only Class I carriers, whereas the *Railway Age* figures cover all carriers, and also industrial users.

The details in the appended list of locomotive orders were supplied by railways and other purchasers in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the cooperation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. The *Railway Age* does not desire to make any claims as to the scientifically statistical accuracy of the tables or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is hoped they meet with entire adequacy.

Locomotive Orders in 1934

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Aliquippa & Southern	1	0-8-0	Sw.	231,800	58,300	25 x 28	June	September	American
American Steel Foundries	1	2-6-2	.....	166,000	.....	19 x 24	November	.....	American
Boston & Maine	5	4-6-2	Pass.	339,200	52,800†	23 x 28	July	December	Lima
	5	4-8-2	Freight	415,500	67,500	28 x 32	July	Feb.-Mar., '35	Baldwin
Chicago, Milwaukee, St. Paul & Pacific.	2	4-4-2	Pass.	260,000	30,700	19 x 28	November	1935	American
Delaware, Lackawanna & Western	20	4-8-4	Freight	447,000	72,000	28 x 32	April	Nov.-Dec.	American
Frankfort & Cincinnati	1	2-8-0	.....	120,000	.....	18 x 24	November	.....	American
Great Northern	1	2-8-2	Freight	348,000	72,000	31 x 32	.....	May	Co. Shops
Lehigh Valley	3	4-8-4	Fr. & P.	428,000	66,500	27 x 30	May	December	Baldwin
	2	4-8-4	Fr. & P.	437,000	66,500	27 x 30	May	Jan., '35§	Baldwin
New York, Chicago & St. Louis	15	2-8-4	Freight	416,000	64,100	25 x 34	June	November	American
	5	0-8-0	Sw.	240,000	57,200	25 x 28	June	July	Lima
	*20	Tenders	.....	.....	.....	.....	May	September	Lima
Pittsburgh & West Virginia	3	2-6-6-4	Freight	528,040	113,500†	23 x 32	March	November	Baldwin
Seaboard Air Line	5	2-6-6-4	Freight	480,000	82,300	22 x 30	July	Mar.-Apr., '35	Baldwin
Standard Steel Works Co	1	0-4-0	Sw.	99,500	22,400	16 x 24	June	Jan., '35	Baldwin
Union Carbide Co	1	....	Sw.	127,000	27,800	18 x 24	May	August	Baldwin
Weyerhaeuser Timber Co	1	....	Logging	293,000	59,600	20 x 28	February	July	Baldwin

Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Chilean State Railways	10	2-8-2	Freight	142,700	27,800	19½ x 22	May	November	Baldwin
Government of Venezuela	1	....	Freight	77,100	11,000	12 x 18	June	October	Baldwin
Hui-Nan Railroad—China	2	2-6-2	Pass.	88,000	22,400	16 x 24	October	December	Davenport
National Railways of Colombia	1	2-8-8-2	Fr. & P.	290,000	55,500	17 x 22	August	Feb., '35	Baldwin
National Railways of Mexico	2	2-6-6-2	.....	206,000	41,100	15 x 22	February	1934	American

Electric Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Weight	Horsepower cont. rating	Date of order	Date of delivery	Builder
Chesapeake & Ohio	3	.....	Pusher	80,000	....	October	.....	Atlas
Pennsylvania	‡1	2-D-2	Pass.	402,000	5,000	February	September	Westinghouse-Baldwin
	‡1	2-C + C-2	Pass.	475,000	4,620	March	August	General Electric-Baldwin
	‡14	2-C + C-2	Pass.	460,000	4,620	November	1935	General Electric
	‡25	2-C + C-2	Pass.	460,000	4,620	November	1935	Westnghse.-Baldwin-Co. Shops
	‡9	2-C + C-2	Pass.	460,000	4,620	November	1935	General Electric Co. Shops
	‡9	2-C + C-2	Pass.	460,000	4,620	November	1935	Westinghouse-Company Shops
	‡14	C	Sw.	157,000	570	March	1935	Allis-Chalmers-Company Shops

Oil-Electric, Gas-Electric or Gasoline Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder
American Rolling Mill Co	1	B-B	Sw.	Oil-Electric	144,000	300	1934	December	Gen. Elec.-Ing. Rand
Atchison, Topeka & Santa Fe	1	B-B + B-B	Pass.	Oil-Electric	440,000	3,600	November	May, '35	G. E.-St. L. Car-Winton
Baltimore & Ohio	1	B-B	Pass.	Diesel	220,000	1,800	September	.....	Gen. Elec.-Winton
Belt Ry. Co. of Chicago	1	B-B	Sw.	Oil-Electric	216,000	600	May	June	G. E.-Ing.-Rand
	1	B-B	Sw.	Oil-Electric	203,000	600	May	June	G. E.-Amer.-McI. & Sey.
Boston & Maine	1	B-B	Sw.	Oil-Electric	200,000	600	July	September	G. E.-Amer.-McI. & Sey.
	1	B-B	Sw.	Oil-Electric	200,000	600	July	Jan., '35	Gen. Elec.-I. Rand
Chicago & Western Indiana	1	.....	Sw.	Oil-Electric	.....	600	1934	.....	G. E.-Amer.-McI. & Sey.
Chicago, Burlington & Quincy	1	B	Sw.	Oil-Mech.	25,500	90	January	April	Whitcomb
Chicago Great Western	1	B-B	Sw.	Oil-Electric	210,000	800	December	December	Westinghouse-Baldwin
Delaware, Lackawanna & Western	2	B-B	Sw.	Oil-Electric	204,000	600	April	October	Gen. Elec.-I. Rand
	2	B-B	Sw.	Oil-Electric	204,000	600	May	Jan., '35	Gen. Elec.-Winton
Illinois Central	8	B-B	Sw.	Oil-Electric	200,000	600	November	May, '35	West.-Amer.-McI. & Sey.
	1	C-C	Transfer	Oil-Electric	330,000	2,000	November	Aug., '35	G. E.-Busch Sulzer
	1	C-C	Transfer	Oil-Electric	320,000	1,800	November	July, '35	Gen. Elec.-I. Rand
	1	B-B + B-B	Transfer	Oil-Electric	320,000	1,800	November	July, '35	G. E.-St. L. Car-Winton
Joplin-Pittsburgh	1	B-B	Fr. & Sw.	Gas-Electric	100,000	350	September	Jan., '35	West.-Plymouth-LeRoi
Midland Continental	1	B-B	Mixed	Oil-Electric	140,000	535	February	September	Westinghouse
Missouri Southern	1	B-B	Freight	Oil-Electric	140,000	500	August	Jan., '35	West.-Plymouth-Cummins
Northampton & Bath	1	B-B	Sw. & Trans.	Oil-Electric	220,000	800	March	March	West.-Bethlehem
Southern Pacific-Texas & Louisiana	1	B	Sw.	Gas-Mech.	24,000	100	September	October	Whitcomb
U. S. Navy	2	.....	Sw.	Oil-Electric	.....	300	1934	.....	G. E.-Amer.-McI. & Sey.
Vulcan Detinning Co	1	B	Sw.	Gas-Electric	60,000	250	December	.....	West.-Plymouth-Brill
Winton Engine Co	1	.....	Pass.	.....	440,000	3,600	July	.....	Gen. Elec.-Winton
	1	.....	Sw.	.....	200,000	900	July	.....	Gen. Elec.-Winton

Export

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder
Tata Iron & Steel Co.-India	1	B-B	Sw.	Oil-Electric	120,000	300	October	1935	Gen. Elec.-Ing. Rand

* Not included in totals.
† Tractive force including booster.
‡ These locomotives to be built in lieu of 59 of the lot of 60 freight service locomotives ordered September, 1931.

Freight Cars Ordered in 1934

Last year's total of 24,611 cars, the largest since 1930, exceeds combined business of 1931-1933 period

By Frank W. Kraeger
Associate Editor, Railway Age

WHILE still manifesting in no appreciable degree the characteristics of the "good old days," domestic freight car markets of 1934 were nevertheless on the upgrade in spectacular fashion when compared with immediately preceding years. Orders were placed last year for 24,611 freight cars for domestic service in the United States—a total which is nearly seven times the combined business of 1932 and 1933 and 10,000 cars in excess of the total orders placed during the three-year period, 1931-1933.

In 1933 orders were placed for only 1,685 freight cars for domestic service, the smallest business on record; 1932, with its orders for only 1,968, was the runner-up in this connection. The 1931 figure was 10,880, thus producing a total of 14,533 cars for the three years combined. But, however encouraging 1934 has been as compared with other years of the current business depression, it was nevertheless a very poor business year if judged by pre-depression standards. In only five other years—three of them being 1931, 1932 and 1933—are orders for fewer than 25,000 cars for domestic service reported in Table II, which is continuous back to 1901. In fact in only six other years since the turn of the century have fewer than 50,000 cars been ordered.

As was predicted in this article last year the Public Works Administration railway-loan fund, then becoming available, proved to be a real stimulant to equipment buying in 1934. Last year's largest orders were financed in that manner, including the 12,785 cars ordered early in the year by the Van Sweringen lines and the 7,000 ordered by the Pennsylvania from its own shops. Notable also among 1934 orders was that of the Bessemer & Lake Erie for 100 light-weight freight cars constructed of corten steel.

Export business was likewise on the upgrade during 1934, last year being the best in that connection since 1929. Freight cars ordered in the United States during 1934 for export totaled 1,323 as compared with a combined total of 360 for the three-year period, 1931-1933, and 1,200 in 1930. In 1929 a total of 3,023 freight cars were ordered here for export.

In marked contrast to the improvement in the United States was the further recession in Canadian freight car orders. Last year only 12 freight cars were ordered in that country as compared with 75 in 1933 and 501 in 1932.

Freight cars built during 1933 for domestic service in the United States total 25,176, or more than eleven times

Table I—Freight Car Orders in 1934

For service in the United States	24,611
For service in Canada	12
For export to other countries	1,323
Grand total	25,946

Table II—Orders for Freight Cars Since 1901

Domestic Orders

Year	Freight cars	Year	Freight cars
1901	193,439	1908	62,669
1902	195,248	1909	189,360
1903	108,936	1910	141,024
1904	136,561	1911	133,117
1905	341,315	1912	234,758
1906	310,315	1913	146,732
1907	151,711	1914	80,264

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915	109,792	.....	18,222	128,014
1916	170,054	.....	35,314	205,368
1917	79,367	.....	53,191	132,558
1918	114,113	9,657	53,547	177,317
1919	22,062	3,837	3,994	29,893
1920	84,207	12,406	9,056	105,669
1921	23,346	30	4,982	28,358
1922	180,154	746	1,072	181,972
1923	94,471	8,685	396	103,552
1924	143,728	1,867	4,017	149,612
1925	92,816	642	2,138	95,596
1926	67,029	1,495	1,971	70,495
1927	72,006	2,133	646	74,785
1928	51,200	8,901	2,530	62,631
1929	111,218	9,899	3,023	124,140
1930	46,360	1,936	1,200	49,496
1931	10,880	3,807	151	14,838
1932	1,968	501	77	2,546
1933	1,685	75	132	1,892
1934	24,611	12	1,323	25,946

Prior to 1918, Canadian orders included in "Domestic."

Table III—Freight Cars Built in 1934

	United States	Canada	Total
Domestic	25,176	.....	25,176
Foreign	151	.....	151
Total	25,327	.....	25,327

Comparison with Previous Years

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1899	117,982	1,904	119,886	1906*	236,451	7,219	240,503
1900	113,070	2,561	115,631	1907*	280,216	9,429	284,188
1901	132,591	4,359	136,950	1908*	75,344	1,211	76,555
1902	161,747	2,800	162,599	1909*	91,077	2,493	93,570
1903	153,195	1,613	152,801	1910*	176,374	4,571	180,945
1904	60,955	1,995	60,806	1911*	68,961	3,200	72,161
1905*	162,701	5,305	165,155	1912†	148,357	4,072	152,429

*Includes Canadian output.
†Includes Canadian output and equipment built in company shops.

Year	United States Domestic	United States Foreign	United States Total	Canadian Domestic	Canadian Foreign	Canadian Total	Grand total
1913	176,049	9,618	185,667	22,017	....	22,017	207,684
1914	97,626	462	98,088	6,453	....	6,453	104,451
1915	58,226	11,916	70,142	1,758	2,212	3,970	74,112
1916	111,516	17,905	129,421	.....	....	5,580	135,001
1917	115,705	23,938	139,643	3,658	8,100	11,758	151,401
1918	67,063	40,981	108,044	14,704	1,960	16,664	124,708
1919	94,981	61,783	156,764	6,391	30	6,421	163,185
1920	60,955	14,480	75,435	.....	....	.....	.....
1921	40,292	6,412	46,704	8,404	745	9,149	55,853
1922	66,289	1,126	67,415	458	100	558	67,973
1923	175,748	2,418	178,166	.....	....	.....	.....
1924	113,761	1,141	114,902	1,721	....	1,721	116,623
1925	105,935	3,010	108,945	.....	....	.....	.....
1926	88,862	2,771	91,633	1,645	....	1,645	93,278
1927	63,390	1,087	64,477	2,851	....	2,851	67,328
1928	46,060	938	46,998	5,158	....	5,158	52,156
1929	82,240	3,168	85,408	8,557	....	8,557	93,965
1930	75,188	1,909	77,097	6,923	....	6,923	84,020
1931	13,205	409	13,614	4,633	....	4,633	18,247
1932	3,254	82	3,336	.....	....	.....	3,336
1933	2,160	151	2,311	550	....	550	2,861
1934	25,176	151	25,327	.....	....	.....	25,327

the 1933 production of 2,160 cars. In 1932 the domestic production figure was 3,254 and that of 1931 was 13,205. Last year's is therefore the largest total since 1930 when 75,188 cars were built. Production in the United States for export during 1934 involved the building of 151 freight cars, the same total as that for the previous year. In 1932 American builders produced 82 cars for export.

The foregoing production figures should not be confused with the totals of orders placed. Nor are they comparable with the figures on the number of cars installed as reported in statistics issued by the Association of American Railroads.

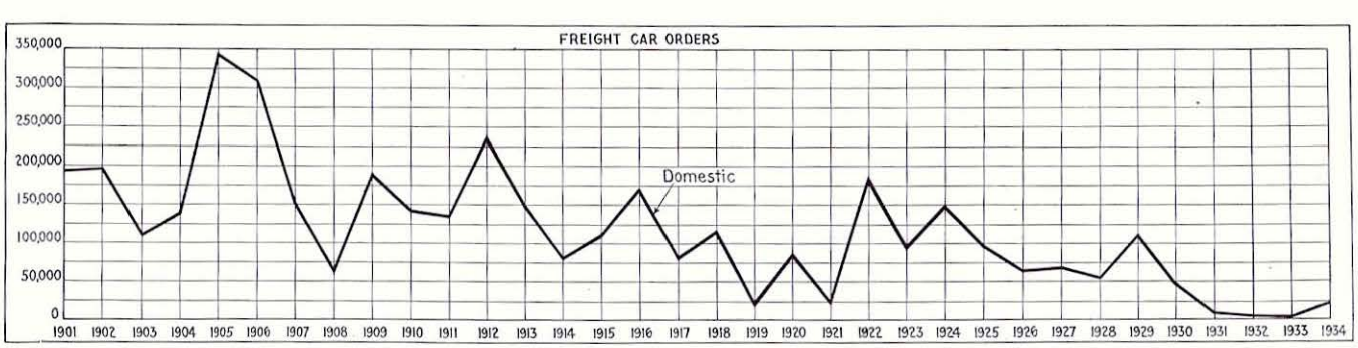
The appended tables contain a detailed statement of orders placed for new freight cars, or those having new bodies, during 1934 by railroads and industrial concerns; also those placed in Canada and for export. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other purchasers of cars, in response to requests for this information. The data thus furnished were then checked against lists of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The production figures were secured in response to requests to the car builders for this information. As in former years the *Railway Age* is especially indebted to the American Railway Car Institute for its kindness in making available reports of the companies affiliated with that organization.

The *Railway Age* is not sufficiently optimistic to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly with respect to comparison with preceding years which, after all, is the primary purpose of the compilations.

Freight Car Orders in 1934

For Service in the United States

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Alaska	20	Hopper	.....	.....		.....	.....	1934	.....	Pressed Steel
	10	Dump	.....	.....		.....	.....	1934	.....	Western-Austin
	2	Box	80,000	37	0	Wood	46,000	1934	1934	Company Shops
American Agricultural Chemical Co.	3	Tank	8,000g.	31	6	Steel	42,000	November	December	Amer. Car & Fdy.
	2	Tank	.....	.....		.....	.....	November	.....	General American
American Cyanamid Co.	1	Tank	.....	.....		.....	.....	January	.....	General American
American Tank Line	10	Tank	80,000	27	8½	Steel	41,800	November	Jan., '35	Amer. Car & Fdy.
	5	Tank	80,000	27	8½	Steel	41,800	December	Feb., '35	Amer. Car & Fdy.
Ansul Chemical Co.	2	Tank	60,000	42	4⅛	Steel	52,900	December	Jan., '35	Amer. Car & Fdy.
Archer-Daniels Midland Co.	6	Tank	.....	.....		.....	.....	March	.....	General American
Bangor & Aroostook	*5	Snow Plows	.....	42	0	Steel	80,000	August	Jan., '35	Russell
Belle Alkali Co.	1	Tank	60,000	30	0	Steel	55,000	June	August	Amer. Car & Fdy.
	2	Tank	.....	.....		.....	.....	October	.....	General American
Bessemer & Lake Erie	100	Hopper	100,000	34	10	Steel Cor-Ten	30,000	December	Feb., '35	Pressed Steel
Cabot, Godfrey L., Inc.	5	Hopper	80,000	45	10½	Steel Frame	48,000	May	October	General American
	5	Hopper	80,000	45	10½	Steel Frame	48,000	October	December	Amer. Car & Fdy.
	5	Hopper	80,000	45	10½	Steel	49,400	January	March	Amer. Car & Fdy.
Calco Chemical Co.	1	Tank	60,000	42	4⅛	Steel	51,400	March	March	Amer. Car & Fdy.
Canton Tank Car Co.	71	Tank	8,000g.	31	6	Steel	41,260	June	July	Amer. Car & Fdy.
	24	Tank	10,000g.	31	6	Steel	46,400	June	July	Amer. Car & Fdy.
	5	Tank	8,000g.	31	6	Steel	42,600	June	July	Amer. Car & Fdy.
Central Chemical	1	Tank	.....	.....		.....	.....	February	December	General American
Central of Georgia	200	Hopper	140,000	41	3	Steel	54,800	April	Sept.-Nov.	Pullman
Chesapeake & Ohio	2,250	Hopper	100,000	33	0	Steel	42,200	May	December	General American
	1,650	Hopper	100,000	33	0	Steel	42,200	April	October	Standard Steel
	850	Hopper	100,000	33	0	Steel	42,200	May	November	Amer. Car & Fdy.
	750	Hopper	100,000	33	0	Steel	42,500	May	September	Ralston
	500	Hopper	100,000	33	0	Steel	42,800	May	October	Pressed Steel
	1,000	F. B. Gondola	100,000	40	6	Steel	44,500	May	August	Amer. Car & Fdy.
	650	S. S. Box	100,000	40	6	Steel Frame	45,200	April	September	Pullman
	100	S. S. Furniture	100,000	50	6	Steel Frame	60,700	May	August	Mount Vernon
	50	S. S. Auto	100,000	40	6	Steel Frame	56,200	May	June	Amer. Car & Fdy.
	10	Hopper	100,000	35	0	Steel	33,000	December	April, '35	Amer. Car & Fdy.
Chicago Great Western	500	D. S. Box	100,000	40	6	Steel	44,400	May	September	Pullman
Coltexo Corp.	5	Hopper	80,000	45	10½	Steel	49,800	June	September	Amer. Car & Fdy.
Crystal Car Line	75	Tank	8,000g.	.....		Steel	.....	September	.....	General American
Delaware & Hudson	50	Hopper	110,000	34	0	Steel	43,100	June	December	Company Shops
Delaware, Lackawanna & Western	350	Hopper	100,000	34	0	Steel	42,600	May	Aug.-Sept.	Amer. Car & Fdy.
	150	Hopper	100,000	34	0	Steel	42,600	May	October	Magor
Detroit, Toledo & Ironton	15	Cov. Hopper	100,000	22	8	Steel	45,700	June	September	Greenville
Diamond Alkali Co.	2	Tank	30,000	42	4⅛	Steel	52,900	February	February	Amer. Car & Fdy.
	2	Tank	.....	.....		.....	.....	April	.....	General American
Dow Chemical Co.	2	Tank	.....	.....		.....	.....	January	.....	General American
	6	Tank	.....	.....		.....	.....	June	.....	General American
Du Pont de Nemours & Co., E. I.	2	Tank	100,000	31	2	Steel	51,200	April	May	Amer. Car & Fdy.
	3	Tank	100,000	30	6½	Steel	45,600	June	July	General American
	4	Tank	140,000	39	3⅛	Steel	85,400	July	August	Amer. Car & Fdy.
	1	Tank	80,000	31	6	Steel	51,400	November	December	Amer. Car & Fdy.



Freight Car Orders From 1901 to 1934

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Electro Bleaching Gas Co.	5	Tank	30,000	28	7	Steel	48,500	March	May	Amer. Car & Fdy.
	2	Tank	.....	.....		.....	.....	April	.....	General American
Elgin, Joliet & Eastern	8	.....	.....	.....		.....	.....	1934	1934	Company Shops
Erie	125	Flat	140,000	50	0	Steel	51,800	March	August	Ryan
	50	Cov. Hopper	100,000	22	8	Steel	45,700	March	Aug.-Sept.	Greenville
	750	Twin Hopper	100,000	33	0	Steel	42,100	March	Aug.-Sept.	Standard Steel
	750	Twin Hopper	100,000	33	0	Steel	42,500	March	July-Aug.	Pressed Steel
	750	Twin Hopper	100,000	33	0	Steel	42,500	March	June-Oct.	Greenville
	250	Twin Hopper	100,000	33	0	Steel	42,100	March	Sept.-Oct.	Ryan
	100	Furniture	80,000	50	6	Steel	59,800	March	Aug.-Sept.	Magor
	500	Box	100,000	40	6	Steel	46,000	March	Aug.-Sept.	Amer. Car & Fdy.
	500	Auto	100,000	40	6	Steel	56,400	March	June-Aug.	Amer. Car & Fdy.
Ethyl Gasoline Corp.	3	Tank	3,000g.	27	0¼	Steel	42,900	April	May	Amer. Car & Fdy.
	3	Tank	6,000g.	30	10½	Steel	52,700	April	May	Amer. Car & Fdy.
Fleischmann Transportation Co.	2	Wood Tank	100,000	.....		St. Underframe	.....	January	January	Company Shops
General American Transportation Leased to B. T. Babbitt Co.	5	Tank	120,000	.....		.....	.....	1934	.....	Company Shops
Gray Chemical Co.	2	Auminum Tank	8,000g.	.....		Steel Frame	.....	August	November	General American
Great Western Electro-Chemical Co.	2	Tank	.....	.....		.....	.....	March	.....	General American
	1	Tank	.....	.....		.....	.....	June	.....	General American
Gulf, Mobile & Northern	150	S. S. Box	100,000	40	6	St. Underframe	44,500	August	October	Amer. Car & Fdy.
	50	Gondoa	100,000	.....		St. Underframe	.....	1934	1934	Company Shops
Heyden Chemical Co.	1	Tank	.....	.....		.....	.....	February	.....	General American
Hooker Electro-Chemical Co.	2	Tank	60,000	30	0	Steel	61,600	January	March	Amer. Car & Fdy.
	4	Tank	60,000	30	0	Steel	61,606	June	August	Amer. Car & Fdy.
	2	Tank	.....	.....		.....	.....	January	.....	General American
	1	Tank	.....	.....		.....	.....	March	.....	General American
	4	Tank	.....	.....		.....	.....	June	.....	General American
	2	Tank	.....	.....		.....	.....	August	.....	General American
	3	Caboose	.....	.....		St. Underframe	.....	1934	1934	Company Shops
Illinois Terminal	250	S. S. Box	100,000	40	6	Steel	46,500	April	June	Magor
Lehigh & New England	100	Gondola	100,000	41	5⅞	St. Underframe	42,700	April	May	Amer. Car & Fdy.
	150	Hopper	100,000	30	0	Steel	40,800	March	June	Pressed Steel
Lehigh Valley	250	Gondola	140,000	50	0	Steel Frame	57,500	December	May, '35	Bethlehem
Liquid Carbonic Corp.	6	Box	80,000	44	6⅜	Steel	57,400	March	July	Amer. Car & Fdy.
Magnolia Petroleum Co.	5	Tank	.....	.....		St. Underframe	36,000	December	Feb., '35	General American
	5	Tank	.....	.....		St. Underframe	36,000	December	May, '35	General American
Mathieson Alkali Works	6	Box	80,000	43	5⅜	Steel	70,000	December	Mar., '35	Amer. Car & Fdy.
Merchants Despatch, Inc.	48	Refrigerator	70,000	33	2	St. Underframe	60,200	Feb.-Aug.	Feb.-Aug.	Company Shops
Merrimac Chemical Co.	1	Tank	9,800g.	31	9¾	Steel	54,900	September	November	Amer. Car & Fdy.
Mesta Machine Co.	2	Gondola	200,000	34	1⅜	Steel	54,000	August	September	Standard Steel
	2	Flat	200,000	35	0	Steel	47,300	August	September	Standard Steel
Monsanto Chemical Co.	1	Tank	5,000g.	.....		Steel	.....	May	July	General American
	1	Tank	8,000g.	31	6	Steel	54,500	July	September	Amer. Car & Fdy.
	1	Tank	4,000g.	31	6	Steel	42,000	December	1935	Amer. Car & Fdy.
Morrell Refrigerator Line	150	Refrigerator	70,000	33	0	St. Underframe	65,000	January	April	General American
New England Alcohol Co.	1	Tank	8,000g.	31	6	Steel	42,000	May	June	Amer. Car & Fdy.
	1	Tank	8,000g.	31	6	Steel	42,000	July	September	Amer. Car & Fdy.
New Orleans Public Belt	1	.....	.....	.....		.....	.....	1934	1934	Company Shops
New York, Chicago & St. Louis	675	Gondola	100,000	48	6	Steel	50,200	May	October	Bethlehem
	500	S. S. Box	100,000	40	6	Steel Frame	45,800	April	August	Pullman
	25	Flat	100,000	50	0	St. Underframe	51,900	May	August	Ryan
Niacet Chemicals Corp.	2	Tank	8,000g.	34	4 1/16	Aluminum	37,000	April	September	Amer. Car & Fdy.
	3	Tank	.....	.....		.....	.....	April	.....	General American
Norfolk & Western	725	Hopper (Bod.)	115,000	30	3	Steel	41,500	March	June-Dec.	Company Shops
	25	Hopper (Bod.)	115,000	30	3	Steel	42,900	March	June-Dec.	Company Shops
Pennsylvania	500	S. S. Box	100,000	40	6	Steel	53,800	January	April	Company Shops
	500	S. S. Box	100,000	40	6	Steel	53,800	February	June	Company Shops
	2,500	S. S. Box	100,000	40	6	Steel	49,700	February	August	Company Shops
	1,500	Flat	140,000	50	0	St. Underframe	50,800	February	December	Company Shops
	2,000	S. S. Box	100,000	40	6	Steel	46,500	April	October	Company Shops
Pennsylvania Salt Manufacturing Co.	2	Tank	60,000	30	0	Steel	55,000	March	May	Amer. Car & Fdy.
	2	Tank	4,000g.	23	11½	Steel	35,000	June	July	Amer. Car & Fdy.
	2	Tank	.....	.....		.....	.....	April	.....	General American
St. Louis-San Francisco	7	.....	.....	.....		.....	.....	1934	1934	Company Shops
Saxman Coal & Coke Co.	5	Hopper	100,000	30	0	Steel	39,100	March	May	Amer. Car & Fdy.
Seaboard Air Line	700	D. S. Box	100,000	40	6	Steel	45,200	June	December	Standard Steel
	300	D. S. Box	100,000	40	6	Steel	45,900	June	.....	Standard Steel
	100	Phosphate	140,000	34	10	Steel	50,800	August	.....	Standard Steel
	10	.....	.....	.....		.....	.....	1934	1934	Company Shops
Shippers' Car Line	1	Tank	8,000g.	28	0	Steel	45,055	May	May	Amer. Car & Fdy.
South Georgia	1	S. S. Box	80,000	40	0	Steel Frame	52,400	Dec., '33	February	Mount Vernon
Southern Pacific	1	Tank	12,500g.	.....		.....	.....	March	June	General American
Stauffer Chemical Co.	1	Tank	.....	.....		.....	.....	May	.....	General American
	2	Tank	.....	.....		.....	.....	August	.....	General American
Sun Oil Company	30	Tank	80,000	.....		Steel	40,000	April	May	General American
Tacoma Elec. Chem.	2	Tank	.....	.....		.....	.....	March-April	.....	Amer. Car & Fdy.
Tank Car Corp.	2	Tank	.....	.....		.....	.....	May	.....	General American
Taylor Chemical Corp.	1	Tank	8,000g.	31	6	Steel	42,500	November	Jan., '35	Amer. Car & Fdy.
Union Carbide Co.	2	Hopper	100,000	30	0	Steel	39,300	April	May	Amer. Car & Fdy.
Union Oil Co. of Calif.	2	Tank	100,000	31	1⅝	Steel Frame	64,300	August	September	General American
Union Starch Co.	10	Tank	.....	.....		.....	.....	June	.....	General American
U. S. Dept. Interior—Bureau of Reclamation	2	Flat	.....	.....		.....	.....	1934	.....	Am. Car & Fdy.
U. S. Navy	3	Flat	.....	.....		.....	.....	1934	.....	Haffner-Thrall
	2	Box	.....	.....		.....	.....	1934	.....	Haffner-Thrall

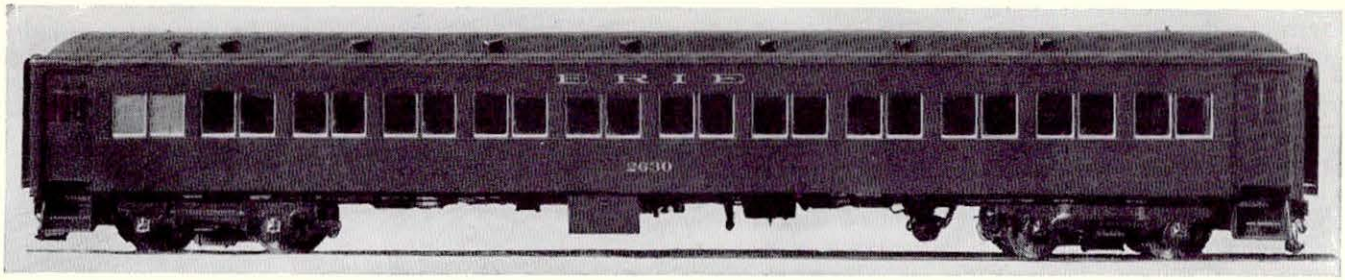
Export

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Bethlehem Steel Co.	8	Dump	140,000	.....		.....	.....	1934	.....	Magor
Newfoundland Railway	25	S. S. Box	60,000	35	10	Steel Frame	.....	August	November	Magor
Mexican Ry. Co., Ltd.	30	S. S. Box	60,000	36	0	Steel Frame	.....	October	.....	Pressed Steel
	20	S. S. Auto	60,000	42	0	Steel Frame	.....	October	.....	Pressed Steel
National Railways of Mexico	600	Box	100,000	40	6	Steel	44,400	1934	.....	Pullman
	200	Box	60,000	32	0	Steel	30,385	1934	.....	Pullman
	400	.....	.....	.....		.....	.....	1934	.....	General American
United Fruit Co.	40	Fruit	25,000	36	6	Steel	22,500	1934	.....	Standard Steel

Canada

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Canadian General Transit	5	Tank	80,000	28	0½	Steel	39,200	June	July	Can. Car & Fdy.
	5	Tank	100,000	28	11½	Steel	43,400	June	August	Can. Car & Fdy.
	2	Tank	80,000	28	4¼	Steel	42,400	June	July	Can. Car & Fdy.

* Not included in totals.



One of Fifty Semi-Suburban Coaches built for the Erie by the American Car & Foundry Company

Passenger Car Orders in 1934

Total of 388 reflects dramatic upturn after three record low years—Air conditioning proceeds apace

By Frank W. Kraeger
Associate Editor, Railway Age

REFLECTING the alertness of railway managements in their endeavors to meet adequately the current demand for up-to-date equipment, the 1934 markets for passenger-train cars were the most active since 1930, while at the same time the work of installing air-conditioning equipment proceeded at a greatly accelerated pace. Last year 388 passenger-train cars were ordered for domestic service in the United States—a small total indeed, as compared with pre-depression years, but still a dramatic upturn when contrasted with the six ordered in 1933 and the 56 ordered in the entire three-year period from 1931 to 1933 inclusive. In 1930 a total of 667 passenger-train cars were ordered while the 1929 total was 2,303. These figures do not include rail motor cars nor the units of articulated trains which are considered in a separate article elsewhere in this issue.

Table I—Passenger Car Orders of 1934

For service in the United States	388
For service in Canada	...
For export to other countries	15
Grand total	403

The influence of the movement toward lighter trains which was initiated in the articulated, streamlined motor trains is seen in the table of passenger cars ordered included in this article. The possibilities of reducing weight without sacrifice of structural strength which new materials have made available have been or are being employed along with modifications in shape and smooth exterior surfaces in the case of several of the orders listed. In one case the coaches are being built for operation in fully streamlined trains to be hauled by streamlined rail motor cars—trains which will be much like the articulated units except for the greater flexibility, and increased weight, of the independent coach units. These coaches, however, will represent a reduction of 15 to 20 tons in weight as compared with a conventional steel passenger coach of moderate weight and thus ma-

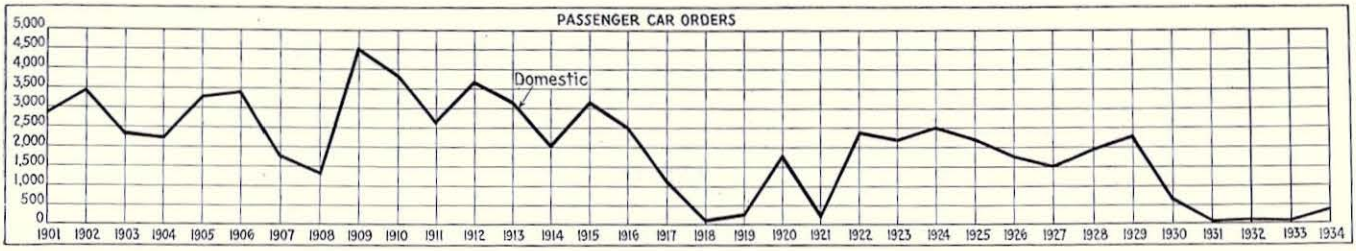
Table II—Orders for Passenger Cars Since 1901

Domestic Orders Only

Year	Passenger cars	Year	Passenger cars
1901	2,879	1909	4,514
1902	3,459	1910	3,881
1903	2,310	1911	2,623
1904	2,213	1912	3,642
1905	3,289	1913	3,124
1906	3,402	1914	1,674
1907	1,791	1915	1,978
1908	1,319		

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1916	2,302	...	109	2,411
1917	1,124	...	43	1,167
1918	9	22	26	57
1919	292	347	143	782
1920	1,781	275	38	2,094
1921	246	91	155	492
1922	2,382	87	19	2,488
1923	2,214	263	6	2,483
1924	2,554	100	25	2,679
1925	2,191	50	76	2,317
1926	1,868	236	58	2,162
1927	1,612	143	48	1,803
1928	1,930	334	29	2,293
1929	2,303	122	33	2,458
1930	667	203	15	885
1931	11	11	21	43
1932	39	...	...	39
1933	6	...	...	6
1934	388	...	15	403



Passenger Car Orders From 1901 to 1934

terially improve the rate of acceleration and speeds which can be obtained in Diesel-electric motor-train operation.

Activity in the air-conditioning field during 1934 brought the total cars so-equipped and in service at the close of the year to more than 2,500; of these 1,878 were placed in service last year. At the close of 1933 there were 648 air-conditioned cars in service. Of the total Pullman and railroad-owned cars fitted with air-conditioning equipment last year, 932 were equipped with mechanical refrigeration systems, 749 with ice refrigeration and 197 with steam-ejector systems.

That these passenger service modernization programs of the railroads are reaping their just rewards is indicated by the fact that last year's passenger revenues were above those of 1933, despite rate reductions and many low excursion fares. This is the first time since 1923 that passenger revenues have thus increased over those of a previous year. Among 1934's large orders were those of the Erie for a total of 133 cars; Chicago, Milwaukee, St. Paul & Pacific, 85 cars; and New York, New Haven & Hartford, 50 cars.

Passenger-train cars ordered in the United States for export during 1934 totaled 15. This business, small

Table III—Passenger Cars Built in 1934

	United States	Canada	Total
Domestic	268	...	268
Foreign	15	...	15
	283	...	283

Comparison with Previous Years

Year	Domestic	Foreign	Total
1899	1,201	104	1,305
1900	1,515	121	1,636
1901	1,949	106	2,055
1902	From 1902 to 1907		1,948
1903	passenger car figures		2,007
1904	in these two columns		2,144
1905*	included in corre-		2,551
1906*	sponding freight car		3,167
1907*	columns.		5,457
1908*	1,645	71	1,716

Passenger Cars Built—Comparison with Previous Years (Continued)

Year	Domestic	Foreign	Total
1909*	2,698	151	2,849
1910*	4,136	276	4,412
1911*	3,938	308	4,246
1912†	2,822	238	3,060

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

	United States			Canadian			
Year	Domestic	Foreign	Total	Domestic	Foreign	Total	Grand total
1913	2,559	220	2,779	517	...	517	3,296
1914	3,310	56	3,366	325	...	325	3,691
1915	1,852	14	1,866	83	...	83	1,949
1916	1,732	70	1,802	37	...	37	1,839
1917	1,924	31	1,955	45	...	45	2,000
1918	1,480	92	1,572	1	...	1	1,573
1919	306	85	391	160	...	160	551
1920	1,272	168	1,440	...	...	...	1,440
1921	1,275	39	1,314	361	...	361	1,675
1922	676	144	820	71	...	71	891
1923	1,507	29	1,536	...	...	...	1,536
1924	2,150	63	2,213	167	...	167	2,380
1925	2,363	50	2,413	...	...	...	2,411
1926	2,184	102	2,286	285	...	285	2,571
1927	1,785	50	1,835	126	...	126	1,963
1928	1,356	15	1,371	237	...	237	1,608
1929	1,254	20	1,274	162	...	162	1,436
1930	1,264	40	1,304	210	...	210	1,514
1931	198	21	219	66	...	66	285
1932	39	...	39	...	...	...	39
1933	6	...	6	...	...	...	6
1934	268	15	283	...	...	...	283

†Passenger Car Orders in 1934

For Service in the United States

Purchaser	No.	Class	Length Ft.	Length In.	Principal Material of Construction	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Alaska Railroad	1	Coach	81	6	Steel	84	119,000	1934	1934	Company Shops
Baltimore & Ohio	1 AC	Diner & L. C.	70	0	Aluminum	.....	86,000	May	May '35	Am. Car & Fdy.
	1 AC	Mail & Bagg.	67	10	Aluminum	.....	74,000	May	May '35	Am. Car & Fdy.
	3 AC	Passenger	70	0	Aluminum	64	78,700	May	May '35	Am. Car & Fdy.
	2 AC	Chair	70	0	Aluminum	24	77,900	May	May '35	Am. Car & Fdy.
	1 AC	Obs. Chair	70	0	Aluminum	32	75,150	May	May '35	Am. Car & Fdy.
	1 AC	Diner & L. C.	70	0	Cor-Ten Steel	.....	95,000	May	Apr. '35	Am. Car & Fdy.
	1 AC	Mail & Bagg.	67	10	Cor-Ten Steel	.....	78,000	May	Apr. '35	Am. Car & Fdy.
	3 AC	Passenger	70	0	Cor-Ten Steel	64	86,700	May	Apr. '35	Am. Car & Fdy.
	2 AC	Chair	70	0	Cor-Ten Steel	24	85,900	May	Apr. '35	Am. Car & Fdy.
	1 AC	Observation	70	0	Cor-Ten Steel	32	83,150	May	Apr. '35	Am. Car & Fdy.
Boston & Maine	10 AC	Coach	80	0¼	Steel	84	107,500	July	Feb. '35	Pullman-Bradley.
	21	Coach	79	1½	Steel	98	90,500	July	Mar. '35	Pullman-Bradley.
Chesapeake & Ohio	15	Coach	78	4½	Steel	80	142,000	May	Feb. '35	St. Louis Car
	11	Mail & Exp.	73	5¼	Steel	.....	140,100	May	Jan. '35	St. Louis Car
Chicago, Burlington & Quincy	7	.....	.....		.....	.....	.....	1934	1934	Company Shops
Chicago, Milwaukee, St. Paul & Pacific	42	Coach	80	5¾	Steel	63	106,000	April	Sept.-Oct.	Company Shops
	8	Coach	80	5¾	Steel	56	109,000	April	October	Company Shops
	23	Baggage	74	6	Steel	.....	103,000	April	November	Company Shops
	2	Cafe-Bag.	74	6	Steel	24	120,000	October	November	Company Shops
	8	Pass. & Bag.	56	1	Steel	24	57,000	March	December	Company Shops
	2	.....	.....		.....	.....	.....	1934	1934	Company Shops
Erie	8	P. B. & M.	66	8	Steel	38	124,000	March	Sept.-Oct.	Am. Car & Fdy.
	50	Coaches	.....		Steel	92	.....	March	July-Aug.	Pullman
	25	Coaches	.....		Steel	92	108,100	March	Sept.-Oct.	Pressed Steel
	50	Coaches	75	9	Steel	88	115,165	March	Aug.-Oct.	Am. Car & Fdy.
Gulf, Mobile & Northern	2 AC	Coach	75	10	Steel	62	74,700	July	April '35	Am. Car & Fdy.
	1 AC	Coach	75	10	Steel	72	74,700	July	April '35	Am. Car & Fdy.
	2 AC	Obs. Sleep.	77	0	Steel	32	71,200	July	April '35	Am. Car & Fdy.
New York, Chicago & St. Louis	5	Coach	82	4¼	Steel	78	155,780	April	September	Pullman
	2 AC	Coach	82	4¼	Steel	78	163,150	April	September	Pullman
	1	Mail & Exp.	73	5¼	Steel	.....	140,100	May	December	St. Louis Car
New York, New Haven & Hartford	50 AC	Coach	80	0	Steel	84	107,500	March	Dec.-Feb. '35	Pullman-Bradley
Norfolk & Western	10 AC	Coach	84	2¾	Steel	54	130,600	May	1934-1935	Bethlehem
	8 AC	Pass. & Bag.	84	2¾	Steel	24	127,000	May	1935	Bethelehm
St. Louis-San Francisco	2	.....	.....		.....	.....	.....	1934	1934	Company Shops
Northern Pacific	6 AC	Coach	82	10½	Steel	58	130,000	December	.....	Pullman

†AC Indicates cars are air conditioned

Export

Purchaser	No.	Class	Length Ft.	Length In.	Principal Material of Construction	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Chilean State Rys.	15	Coach	74	0	Steel	82	102,000	May	November	Bethlehem
	*3	Diner	.....		.....	.....	.....	1934	1934	Company Shops

*Not included in totals.

though it be, is nevertheless distinctly encouraging for it follows two years of stagnation—in neither 1933 nor 1932 were any passenger-train cars ordered here for export. Furthermore although last year's export total is less than the 1931 figure of 21 it is larger than the 1930 business of 15 cars.

For the third successive year no passenger-train cars were ordered by Canadian railroads from builders in that country. In 1931 orders were placed in Canada for 11 cars as compared with 203 in 1930.

Passenger-train cars built in the United States for domestic service in 1934 totaled 268 as compared with six in 1933 and 39 in 1932. Production here last year for export involved the building of 15 cars while passenger car building in Canada was at a standstill—a condition which has persisted there for three years.

The list of orders which follows, amplifying the summary tables published herewith, has been compiled in the usual way, returns from railroads being checked against lists of orders supplied by the car builders, largely through the courtesy of the American Railway Car Institute.

More Articulated Motor Trains Ordered than in 1933

Use of new materials for light-weight provides low weight-power ratio for high speeds with moderate power-plant capacity

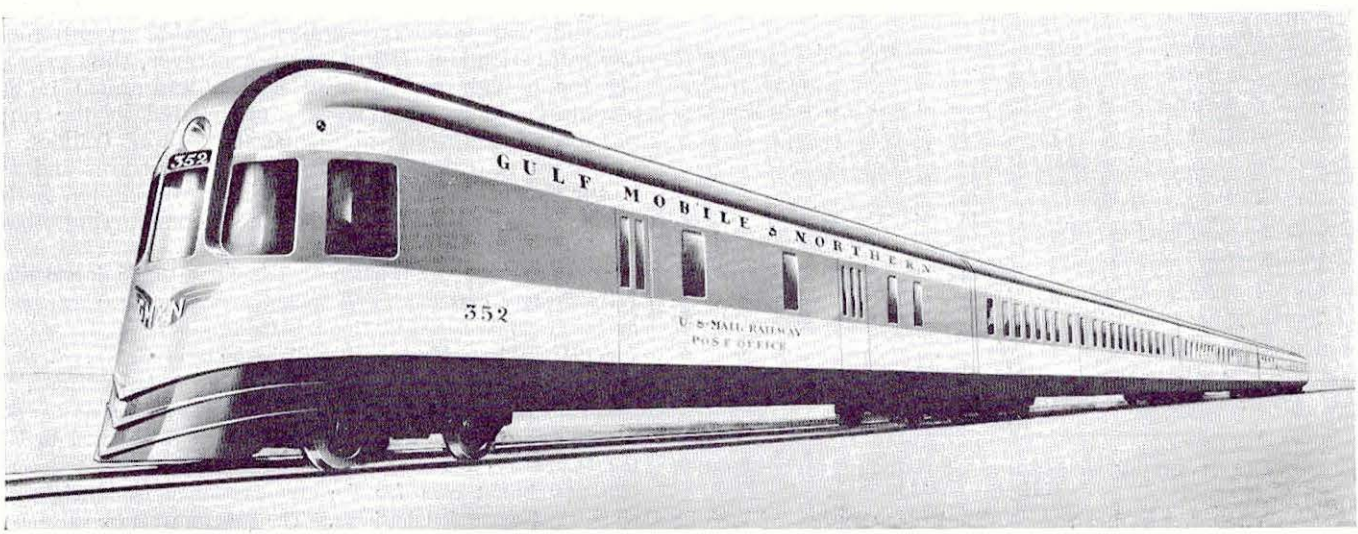
By C. B. Peck
Mechanical Department Editor, Railway Age

THE steam railways of the United States during 1934 ordered seven articulated motor trains, six rail motor cars and one additional body unit for an articulated train, a total of 14 self-propelled train or car units, as compared with 18 during 1933, only three of which were articulated trains. No orders were placed last year for equipment of this type for export and none was ordered in Canada.

When compared on the basis of the number of units the showing for 1934 is less favorable than that for the preceding year. When compared on the basis of the amount of passenger transportation represented, however, the seven motor trains with their aggregate of 37 body units, plus seven single car or body units, represent a marked increase as compared with 1933's three motor trains with an aggregate of 13 car bodies, plus 11 single rail cars.

The articulated motor trains, first placed in service during 1934, have marked the beginning of a new movement in passenger transportation. There are two aspects of this movement. These are increases in passenger-train speeds and reductions in the costs of operation per train-mile.

The ability of a train to meet severe schedule conditions is largely affected by the relation between total weight and power-plant capacity. The larger the power plant in relation to the weight the higher the rate of acceleration and the higher the operating speeds which may be attained. On the other hand, not only does increasing the size of the power plant increase direct operating expense, but at the high cost per horsepower of the Diesel-electric power plant it also markedly increases the total carrying charges. There is also the law of diminishing returns tending to reduce the advantage



An Artist's Drawing of the Diesel-Electric Streamlined Train Now Being Built by American Car and Foundry for the Gulf, Mobile & Northern. Powered with a 660-Hp. McIntosh & Seymour Engine

of the self-propelled unit as compared with the train hauled by a separate locomotive as the size of the power plant increases.

Orders for Articulated Motor Trains, Rail-Motor Cars and Trailers

	1922	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34
For service in U. S...	51	77	120	149	142	180	175	132	54	26	15	18*	14†
Canada...	7	3	12	7	4	9	10	10	8	4	4	..	..
For export..	1	22	...	34	32	12	9	28	3	10	2	3	..
Total...	59	102	132	190	178	201	194	169	65	40	21	21*	14†
Motor trains and cars..	50	93	112	171	161	176	172	159	56	40	20	17*	13†
Trailers.....	9	9	20	19	17	25	22	11	9	..	1	4	1‡

* Includes three articulated trains.
† Includes seven articulated trains.
‡ This is a body unit for addition to an articulated train.

It is evident, therefore, that in the attainment both of high speeds and operating economy the reduction in weight has been of great importance. Furthermore, the streamlining of these trains has also been effective in keeping down the power-plant capacity required for the attainment of the high speeds at which they were built to operate. The principle of articulation has been employed largely because of the saving in weight it effected by the reduction in the number of trucks. The cross-section of the car bodies has been reduced both as a means of saving weight and of reducing air resistance at high speeds.

Power-Plant Capacity of Articulated Motor-Trains and Rail-Motor Cars, U. S. and Canada

Horsepower Over	To and incl.	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
...	100.....	13	14	2	5	6	2	..	5*	7	..
100	125.....	5	7	..	1	3	..	..	3	1	..
125	150.....	9	..	..	4	1	..	..	..	..	..
150	175.....	20	1	..	1	..	..	..	..	..	2
175	200.....	49	3	3	1	..	..	..	..	1	..
200	250.....	36	65	43	13	2	..	..	..	..	..
250	300.....	2	26	76	64	15	7	1	..	..	..
300	350.....	2	..	..	30	2	2	..	..	..	..
350	400.....	..	..	..	18	64	25	22	6	1	..
400	450.....	..	8	7	6	2	..	1	..	..	..
450	500.....	..	11	1	4	5	..	..	..	..	..
500	600.....	..	..	8	12	21	17	5	4	2	3
600	700.....	..	..	..	..	..	..	..	..	..	2
700	800.....	..	..	..	3	9	..	..	..	..	3
800	900.....	..	..	..	..	..	..	1	..	1	..
Over 1,000.....		..	..	..	..	..	..	..	..	..	3
Unclassified.....		..	..	24	1	2	..	..	..	..	..

* Four are small cars for a 3-ft. gage line.

service within the past year. The first articulated trains built for the Union Pacific and the Burlington, for instance, are each provided with one nominal horsepower for each 330 to 350 lb. of total train weight. By way of comparison consider a 600-hp. rail motor car of conventional design hauling two steel passenger cars of moderate weight and the ratio resulting will be over 600 lb. per nominal horsepower capacity—nearly twice as great as in these light-weight articulated trains.

Light-Weight Cars for Separate Motive Power

While the development of these extremely light-weight trains is definitely associated with the internal-combustion power plant in the public mind, the new materials which make weight reductions possible without the sacrifice of adequate strength are already being employed in the construction of passenger cars for operation behind separate motive-power units—a development destined to be of far-reaching import in the future trend of all rolling stock for railway passenger service.

One evidence of this development may be cited from the list of orders placed during 1934 included in this article. This is the order for two streamlined rail motor cars, in the construction of which alloy steel has been used to reduce weight, which will furnish the motive power for trains made up of coaches and sleeping cars weighing less than 40 tons each.

There is also evidence of a return to the light-weight rail motor car designed for operation without trailing load—a condition which the first rail motor cars were designed to meet. In the new cars, however, advantage has been taken of the new materials to reduce weight and sufficient power is installed to provide an extremely low ratio of about 230 lb. per horsepower, thus providing for a high rate of acceleration and much higher operating speeds than were contemplated in the early rail motor cars designed to operate without trailers.

The list of orders for articulated motor trains and rail motor cars placed with the builders in the United States during 1934 is shown in one of the accompanying tables.

PLANS for the construction or rebuilding of 95 locomotives, 211 passenger cars and 2,486 freight cars have been announced by the Great Western of Great Britain as part of its program for 1935. The rolling stock will be built in G. W. R. shops and the outstanding feature of this part of the program, the road's announcement says, will be the construction of ten new locomotives of the "Castle" class, such as those used to haul the "Cheltenham Flyer," the world's fastest steam train, and two new buffet cars for the accommodation of special-party, outing and excursion business. The program also contemplates renewal work on 390 mi. of track and the rebuilding of some 130 bridges.

Orders for Articulated Motor Trains and Rail-Motor Cars

For Service in the United States

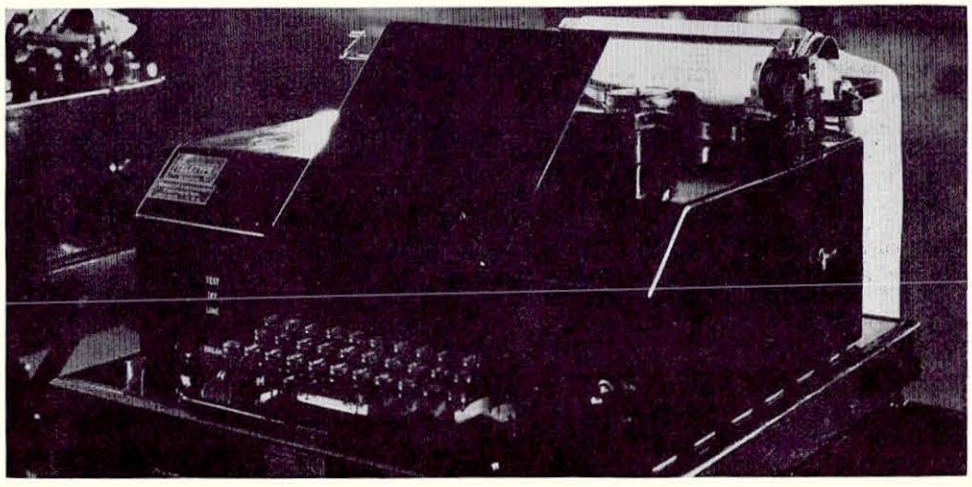
Road	No.	No. Car Units Each	Type of Power Plant	Horse-power	Seating Capac.	Length of Bagg. Compt. Ft.	Length of Bagg. Compt. In.	Weight	Builder
Boston & Maine.....	1AC	3	Oil-Electric	600	144	10	8	207,619	Winton-General Electric-Budd
	1	1	Oil-Electric	800	...	35	11	200,000	Ing.-Rand-General Electric-St. L. Car
	1	1	Oil-Electric	800	...	35	11	200,000	Westinghouse-St. L. Car
Chicago, Burlington & Quincy....	2	3	Oil-Electric	600	88	28	0	210,000	Winton-General Electric-Budd
	*1	Coach Body	.....	...	40	..	..	.....	Budd
Gulf, Mobile & Northern.....	2	2	Oil-Electric	660	...	31	8½	168,000	McI. & Sey.-West.-American
Illinois Central.....	1	5	Oil-Electric	1,200	148	21	0	493,000	Winton-General Electric-Pullman
New York, New Haven & Hartford	1AC	3	Oil-Electric	800	164	..	..	250,000	Westinghouse-Goodyear
Norfolk Southern.....	2	2	Gasoline	168	53	12	11	41,400	Hall Scott-Brill
Union Pacific.....	†2	10	Oil-Electric	1,200	104	54	5	.....	Winton-General Electric-Pullman

* Stainless Steel, for addition to an articulated train. † 8 of the 20 cars in these 2 trains are being built for the Pullman Co.

Communication Service Held Its Own

Pole-line renewals exceeded those of previous year—Telegraph-printer applications extended

By O. C. French
Associate Editor, Railway Age



Telegraph Printers Are Leading to Greater Economies

IN PLACE of the sharp reductions of previous years, there was a moderate increase in the activities of the railway communication service during 1934. Chief among the increases reported was the doubling of the number of new telegraph-printer machines installed and the miles of line circuits used by these machines, as compared with the previous year. The extension of long-distance telephone service progressed at a rapid rate, the figures for 1934 exceeding those of 1933 by approximately 72 per cent. As a whole, the prospects for continued increases appear to be better than they have been since the end of 1931.

During the five-year period ending with 1933, the volume of equipment renewals, additions and betterments, and the maintenance of plant facilities in railway communication service changed from a peak in 1929 to little more than bare maintenance in 1932. As might be expected, the utilization of existing communication facilities did not warrant a continuation of the rate of expansion which culminated in the 1929 peak, inasmuch as the telephone and telegraph service required by a railroad is dependent to a large extent upon the volume of business. The capacity of telegraph and telephone equipment has been, with a few exceptions, entirely adequate for the business handled of late. As a consequence, the building of new lines and the initiation of improved service have, since 1930, been confined to projects that lead to operating economies offering large returns on the investment required for their completion.

Nevertheless, there is a limit to the inclination and the ability of the railroads to postpone the renewal of

Table A—Principal Increases in Plant Facilities During 1934, Compared with 1933

		1934	1933
Miles of new or rebuilt pole line:			
Railroad owned	2,156		
Commercially owned	1,973		
Jointly owned	1,185		
Total		5,314	4,919
Mileage of new copper wire:			
Railroad owned	2,373*		
Commercially owned	768		
Total		3,141	3,755
Increase in miles of road dispatched by telephone		174	178
Increase in miles of long-distance telephone circuits		3,314	1,923
New mileage of telegraph circuits, all types		818	4,421
Increase in miles of printing telegraph circuits		5,479	2,586
Number of new printing telegraph machines		43	20

* Including 176 miles of Copperweld.

Table B—Principal Copper Wire Installations Completed in 1934

Railroad	Railroad Owned	Miles of New Copper Wire Commercially Owned	Total
Canadian National (System)	227	60	287
Canadian Pacific	6	136	142
Chesapeake & Ohio	118	...	118
Chicago, St. Paul, Minneapolis & Omaha	176*	...	176*
Delaware & Hudson	123	64	187
Erie	102	104	206
Gulf, Mobile & Northern	146	...	146
Missouri-Kansas-Texas	83	64	147
Missouri Pacific (System)	339	...	339
New York, New Haven & Hartford	396	...	396
Pennsylvania	229	80	309
Seaboard Air Line	112	...	112
Texas & New Orleans	129	44	173

* Copperweld wire.

Table C—Printing Telegraph Installations Completed in 1934

Railroad	Miles of Circuit	Number of Machines
Atchison, Topeka & Santa Fe	1,825	17
New York Central	2,709	16
Michigan Central	535	2
Pennsylvania	27	6
St. Louis-San Francisco	383	2

such properties as pole lines and associated equipment, as well as the improvement of service. One year ago our fourteenth annual statistical review of communication activities pointed out that the decline of activity in this field had been checked, as indicated by reports from approximately 100 railroads. This conclusion is further substantiated by the data furnished by the railroads for 1934, for during this year, five of the items included in these reports showed increases, some quite substantial. Thus, the leveling-off process now shows indications of becoming an upturn, judging by the 1934 statistics.

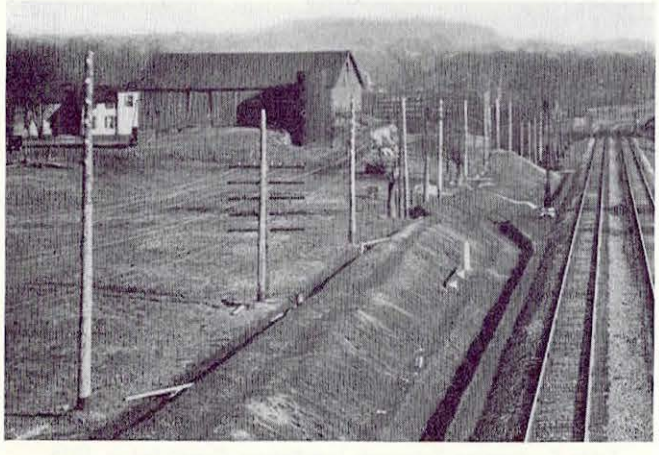
Increases Exceed Reductions

Only two of the items in Table A show appreciable reductions, the remaining items being very close to the 1933 figures. The greatest reduction is in new telegraph circuits, which in 1934 comprised 818 miles as compared with 4,421 in 1933. This reduction is attributable to the fact that the Canadian railroads alone accounted for 4,164 miles of new telegraph lines in 1933 and only 413 miles during last year. Aside from the Canadian installations, the 1934 mileage is nearly double that of 1933, although still far below previous high levels.

Among the increases over the previous year is the mileage of railroad-owned new and rebuilt pole line, which in 1934 aggregated 2,156 miles, an increase of 32 per cent over the previous year. In spite of small reductions in such work performed on jointly- and commercially-owned lines, the sum of these three items shows an increase of 8 per cent. This exceeds the 1932 level also and is only 16 per cent below that for 1931.

Telephone Dispatching Declines

The miles of road over which trains are operated by means of train orders transmitted by telegraph decreased from 96,091 in 1933 to 94,627 in 1934; and the miles of road over which trains are operated by means of train orders transmitted by telephone decreased from 151,443 in 1933 to 151,300 in 1934. Undoubtedly part of both



The Railroads Are Faced with the Necessity of Pole-Line Renewals

of these reductions can be attributed to branch line abandonments. However, on some eastern railroads a point of saturation has been reached in the mileage of telephone-dispatched road. For example, the New York, New Haven & Hartford reported only seven miles of new road dispatched by telephone, this being due to increased operated mileage, for no other increase can be expected inasmuch as the entire road has been dispatched by telephone since 1927. However, such a condition is not yet general, especially with respect to the western roads.

Notwithstanding these reductions, the improvement of the existing telephone services is clearly indicated by the 72 per cent increase over 1933 in the mileage of new long-distance telephone circuits. The 3,314-mile increase also exceeds that recorded for 1932 by 45 per cent. Most of the new circuits were derived by transposing and rearranging existing telegraph circuits, thus converting them for telephone use. Others involved simplexing two wires used in Morse service. The 176 miles of Copperweld line installed by the Chicago, St. Paul, Minneapolis & Omaha is used in long-distance telephone message service but not in train dispatching. The largest mileage reported by any one railroad is that of the Southern (system) which includes 1,624 miles of long-distance circuits. The Missouri Pacific (system) reported a total of 341 miles, of which 153 miles are on the International-Great Northern; the Missouri-Kansas-Texas reported 115, the Illinois Central 394 and the Pere Marquette 152 miles of new telephone circuits. The amount of new copper wire installed in railroad-owned circuits exceeds that of 1933 by 16 per cent. Of the 2,373 miles installed, several hundred miles were for the replacement of existing lines.

Printer Service Extended

The most marked increase over last year's activity is in telegraph-printer installations. The greatest number of these machines installed by the railroads in any one year was in 1929, when 188 machines were reported. From this relatively high level, new installations declined to 31 in 1932, and to only 20 in 1933. However, a total of 43 was reported for 1934, these involving 5,479 miles of circuit. The Atchison, Topeka & Santa Fe reported 17 new machines, utilizing 1,825 miles of circuits. The line circuits required by the new machines on this road were derived from wires formerly used in Morse service. The New York Central accounted for 16 machines. Table C shows those installed on other roads.

Teletype Machines and Carrier Currents

The manner in which the teletype machines are utilized varies rather widely. Applications have been made at important terminals for the transmission of switching lists, wheel and consist reports, and both long- and short-distance message service. The latter in many cases supplants messenger service and practically all installations reduce clerical expense, inasmuch as the same messages can be sent to several different places simultaneously and received directly in typewritten form.

Adding to its existing equipment, the Canadian National installed 578 miles of the carrier-current system. This is an increase over the previous year, during which the Canadian Pacific reported 452 miles. The latter reported no new mileage of carrier-current transmission for 1934, the Canadian National being the only road reporting an installation.

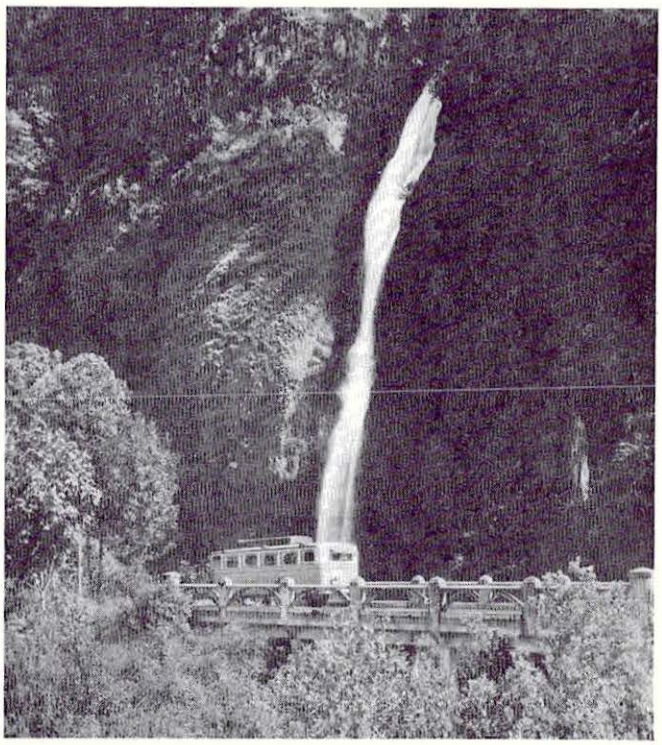
None of the railroads indicated the extent of the program for 1935. However, it is reasonable to believe that there will be moderate gains in the amount of new work and improvements in the service, as well as a renewing of maintenance activity. Like other phases of railway buying, plant expansion and improvements, the outlook depends upon the services required, and the availability of funds for financing improvements, many of which can be made self-liquidating even under present conditions.

Rail-Highway Co-ordination No Longer Experimental

Interest during 1934 centered on increased use of pick-up and delivery service

By Charles Layng

Motor Transport Editor, Railway Age



DEVELOPMENTS in the use of motor transport by the railways in 1934 point directly toward an increasing use of trucks and motor coaches by the railways. While some railroads have had well-knit and efficiently operated motor transport subsidiaries for years, rail-highway co-ordination, viewed from the standpoint of the railways as a whole, has been largely experimental until last year. Plans for such operations have been mostly tentative and subject to radical changes and, in many cases, complete abandonment, at the slightest provocation. This is no longer true. The year 1934 definitely put the railways in the truck business, not as amateurs dabbling in an unfamiliar field, but as professional operators.

Pick-up and delivery service is now an integral part of railway operation. Regarded by many railroads as a radical and somewhat unsafe venture at the beginning of 1934, this service has now become so firmly fixed in the railroad scheme that it would seem to be only a question of time, and a short time at that, before it will become the universal practice. During 1934, hardly a week passed without the announcement of additional service in this respect. Few such radical changes in the history of railroad operation have ever before become so generally accepted in such a short space of time.

Growth of Truck Use

The use of trucks for intercity service in 1934 grew side by side with the growth of pick-up and delivery service, not so spectacularly, perhaps, but nontheless steadily. This is a logical development of the provision of such fast merchandise train service that overnight delivery is now provided from practically every jobbing center to all points up to 300 miles distant. It is a difficult matter to make these schedules, geared up to approximately passenger train speed, and still make a number of stops. Many of the railroads found the answer last year in the handling of freight by rail to certain distribution points and thence by truck to the smaller cities. The drag freight train has disappeared from the railroad picture, and the developments of 1934 point to the elimination of the local freight train as well, by the substitution of fast merchandise trains to distributing points and the use of trucks for delivery.

All of this means a vastly increased use of trucks in railroad service. As yet, much of the trucking is being handled through contract agents, but, with the passing of the experimental stage, this situation began to show signs of change in 1934. Manifestly, with the use of trucks in every day, regular operation on a sound, permanent basis, a different picture presents itself. Even as the railways should and are now rendering a complete transportation service from storedoor to storedoor, so, in logical sequence, the railways can render better and more closely supervised service to their patrons when every operation in this complete transportation is entirely in their own hands. Then, too, the railways, on the basis of what might be termed wholesale pick-up and delivery service, as developed in 1934, can operate their own trucks more cheaply than through contract agents. There is no question but that the contracting for truck service will become more and more rare, and actual railroad ownership and operation more frequent. In the scope of railroad ownership and operation is included, of course, the present joint railroad-owned agencies which are now performing excellent service, not only as to pick-up and delivery but in terminal transfer service as well.

Other Developments of the Year

In addition to pick-up and delivery service, with its co-ordinated inter-city service in many cases, a number of other developments in rail-highway co-ordination were inaugurated in 1934, and attended with almost sensational success. Included among these is the provision of storedoor delivery of automobiles in the Chicago and Twin Cities districts, as well as on the West Coast. These operations, begun in the spring of 1934, have resulted in the return to the railways of much traffic that had been given up as lost to the highways.

Another successful operation is that of the Rock Island

in handling highway trailers for a trucking company by rail into and out of the congested Chicago district during 1934. What appeared at the time to be rather ambitious claims as to the amount of traffic available were made when the operation was begun last June. However, these claims have not only been justified, but the number of cars handled has exceeded expectations.

The practically unanimous trend toward greater use of the motor truck by the railways was further fortified during 1934 by the issuance of the Merchandise Traffic Report by the Federal Co-ordinator, strongly recommending the provision of universal pick-up and delivery service, and a generally increased use of the motor truck by the railways.

Motor Coach Prospects

The progress towards the use of automotive units by the railways in the passenger field in 1934 presented no

Orders for Highway Vehicles

Railroad	No.	Type of Vehicle	Model designation	Seating capacity or truck capacity in tons	Purchased by railroad or subsidiary	Where to be used	Manufacturer
Akron, Canton & Youngstown	1	Sedan	4 Door	.....	Railroad	Co. Business	Ford
Baltimore & Ohio	2	M. Coach	City	21	Subsidiary	Rev.	Dodge-Graham
Boston & Maine	10	M. Coach	Parlor	29	Subsidiary	Rev.	General Motors
	1	Truck	Dump	6 ton	Railroad	Co. Business	Int. Harvester
	1	Truck	Pick-Up	½ ton	Railroad	Co. Business	Ford
	1	Truck	.....	1½ ton	Railroad	Co. Business	Ford
	1	Truck	Stake Body	1½ ton	Railroad	Co. Business	Ford
	1	Truck	Dump	6 ton	Railroad	Co. Business	White
	1	Truck	Dump	6 ton	Railroad	Co. Business	General Motors
	1	Truck	Pick-Up	½ ton	Subsidiary	Co. Business	Chevrolet
	1	Coupe	.....	2	Railroad	Co. Business	Ford
	1	Roadster	.....	2	Railroad	Co. Business	Ford
	1	Sedan	4 Door	5	Railroad	Co. Business	Buick
Chesapeake & Ohio	1	Truck	.....	½ ton	Railroad	Co. Business	Chevrolet
	1	Truck	.....	1½ ton	Railroad	Co. Business	Ford
	1	Truck	.....	1½ ton	Railroad	Co. Business	Chevrolet
Chicago, Burlington & Quincy	27	M. Coach	Parlor	33	Subsidiary	Rev.	General Motors
	3	M. Coach	.....	21	Subsidiary	Rev.	General Motors
	1	M. Coach	.....	16	Subsidiary	Rev.	Reo
	1	M. Coach	.....	12	Subsidiary	Rev.	Reo
Chicago, Milwaukee, St. Paul & Pacific	1	M. Coach	.....	5	Railroad	Co. Business	Chevrolet
	4	Truck	Stake Body	1½ ton	Railroad	Co. Business	Ford
	1	Truck	.....	.....	Railroad	Co. Business	Ford
	1	Truck	Stake Body	1½ ton	Railroad	Co. Business	Chevrolet
	2	Truck	.....	2 ton	Railroad	Business	Int. Harvester
	1	Truck	T-18a	1½ ton	Railroad	Co. Business	General Motors
Chicago, South Shore & South Bend	1	M. Coach	Parlor	20	Railroad	Rev.	Studebaker
Copper Range	2	M. Coach	City	21	.....	Rev.	Ford
Denver & Rio Grande Western	1	M. Coach	Pass.-Baggage	14	Subsidiary	Rev.	.....
	1	M. Coach	.....	33	Subsidiary	Rev.	.....
	2	Truck	.....	3 ton	Subsidiary	Rev.	.....
East Broad Top	1	M. Coach	Parlor	21	Subsidiary	Rev.	General Motors
Maine Central	3	M. Coach	Parlor	29	Subsidiary	Rev.	General Motors
Missouri-Kansas-Texas	2	M. Coach	.....	24	Railroad	Co. Business	Chevrolet
	1	Truck	.....	1½ ton	Railroad	Co. Business	Dodge
Missouri Pacific	6	M. Coach	Parlor	33	Subsidiary	Rev.	.....
Monongahela	3	Truck	Pick up	½ ton	Railroad	Co. Business	General Motors
New York, New Haven & Hartford	6	M. Coach	Parlor	40	Subsidiary	Rev.	A. C. F. Motors
	20	M. Coach	Parlor	21	Subsidiary	Rev.	General Motors
	5	M. Coach	Parlor	17	Subsidiary	Rev.	General Motors
	8	M. Coach	Parlor	33	Subsidiary	Rev.	General Motors
	7	Truck	Canopy Body	3 ton	Railroad	Co. Business	Chrysler
	1	Truck	.....	3 ton	Railroad	Co. Business	Chrysler
	1	Truck	Canopy Body	3 ton	Railroad	Co. Business	Studebaker
	5	Tractor	.....	.....	Subsidiary	Rev.	Ford
	5	Trailer	.....	.....	Subsidiary	Rev.	Whitehead&Kales
	10	Sedan	.....	7	Subsidiary	Rev.	Buick
	4	Sedan	.....	5	Subsidiary	Co. Business	Chevrolet
	6	Sedan	.....	7	Subsidiary	Rev.	Packard
	1	Sedan	.....	5	Railroad	Co. Business	Chrysler
	2	Coupe	.....	5	Subsidiary	Co. Business	Packard
	2	Coupe	.....	.....	Railroad	Co. Business	Chrysler
Norfolk & Western	1	Truck	.....	½ ton	Railroad	Co. Business	Chevrolet
	1	Truck	Express Body	1½ ton	Railroad	Co. Business	Dodge
	1	Truck	Express Body	1½ ton	Railroad	Co. Business	Ford
	1	Truck	Express Body	1½ ton	Railroad	Co. Business	Chevrolet
Norfolk-Southern	2	M. Coach	Parlor	29	Subsidiary	Rev.	A. C. F. Motors
Northern Pacific	4	M. Coach	Parlor	17	Subsidiary	Rev.	Mack
	4	Coach-Truck	.....	9 pass.-4 ton	Subsidiary	Rev.	General Motors
	5	Tractor	.....	.....	Subsidiary	Rev.	White
	5	Semi-Trailer	.....	10 tons	Subsidiary	Rev.	General Motors
Northland Greyhound Lines	12	M. Coach	Parlor	33	.....	Rev.	General Motors
Pacific Electric	9	M. Coach	Street Car	26	.....	Rev.	Twin Coach
	1	M. Coach	Street Car	23	Subsidiary	Rev.	General Motors
	4	M. Coach	Street Car	41	Subsidiary	Rev.	General Motors
Pacific Greyhound Lines	29	M. Coach	Parlor	33–40	.....	Rev.	General Motors
	6	M. Coach	Buffet	33–40	.....	Rev.	General Motors
	3	M. Coach	Parlor	21	.....	Rev.	General Motors
	1	M. Coach	Parlor	16	Subsidiary	Rev.	General Motors
Pennsylvania	17	M. Coach	.....	5	Railroad	Co. Business	.....
	28	Truck	Pick-Up	½ ton	Railroad	Co. Business	.....
	12	Truck	.....	5 ton	Railroad	Co. Business	.....
	2	Truck	.....	½ ton	Railroad	Co. Business	.....
	5	Truck	.....	1½ ton	Railroad	Co. Business	.....
	2	Truck	.....	¾ ton	Railroad	Co. Business	.....
	15	Sedan	.....	5	Railroad	Co. Business	.....
Pennsylvania Greyhound Lines	25	M. Coach	Z-250	33	.....	Rev.	General Motors
Pennsylvania-Reading Seashore Lines	1	Truck	Stake Body	1½ ton	Railroad	Co. Business	Ford
	1	Truck	Open Body	1½ ton	Railroad	Co. Business	General Motors
	1	Sedan	.....	5	Railroad	Co. Business	Ford
Pittsburgh & Lake Erie	1	Truck	Express Body	1½ ton	Railroad	Co. Business	Chevrolet
Railway Express Agency	246	Truck	.....	Light Duty	.....	Rev.	.....
	17	Tractor	.....	.....	.....	Rev.	.....
	10	Trailer	.....	.....	.....	Rev.	.....
Richmond Greyhound Lines	4	M. Coach	Parlor	33	.....	Rev.	General Motors
Southwestern Greyhound Lines	30	M. Coach	Parlor	33	.....	Rev.	General Motors
Spokane, Portland & Seattle	2	M. Coach	Parlor	21	Subsidiary	Rev.	.....
Union Pacific	15	M. Coach	Parlor	33	Subsidiary	Rev.	General Motors
	20	M. Coach	Parlor	33	Subsidiary	Rev.	White
	12	M. Coach	Parlor	21	Subsidiary	Rev.	Chevrolet
Virginia & Truckee	1	Truck	Delivery	1½ ton	Railroad	Co. Business	Ford
	1	Chassis	.....	.....	Subsidiary	Rev.	Ford

such spectacular aspects as in freight transportation. In general, the railways using motor coaches progressed by consolidating their position in this respect, largely through the increased use of motor coaches for the replacement of unprofitable branch line trains.

Even so, there are certain very definite signs in 1934 of an increased growth of co-ordinated rail-highway transportation for passengers in 1935. The quietness in this field is attributable not to any lack of interest and enthusiasm, but to a definite and painful lack of money to buy equipment.

Among the exceptions to the general rule was the Burlington. Until 1934, this company had used motor coaches exclusively on a branch line train replacement basis, but, early in the year, a system of through coach routes was established in the Middle West, including runs up to about 500 miles. Based on the success of these operations, the Burlington announced, late in the year, the inauguration of through bus service between Chicago and the Pacific Coast. This development is particularly important as the first time a railway has ventured so far off its own lines in the operation of through bus routes.

The principal factor pointing to an increased use of motor coaches by the railways is the revived interest being displayed in passenger service in 1934. The methods used by the railways in increasing passenger revenues are described elsewhere in this issue. The fact to be gleaned from this is that a revolution in passenger transportation was begun in 1934, and all indications point to its continuance and expansion in 1935. It is highly likely that this expansion will include the increased use of motor coaches.

Estimate of Vehicles in Service

Of the 60 principal Class I railroads, 56 are now using motor trucks. The marked advance in this field in 1934 is indicated by the fact that reliable estimates place the total figure of motor trucks used by these railways at 25,307 vehicles. In addition to these railways, there are some 45 other lines using motor trucks, most of these coming under the short line classification. In addition to these, a large number of trucks are operated, under railway control, by subsidiaries or affiliated companies, such operations requiring the use of approximately 23,000 vehicles, or a total of 48,307 motor trucks in railway service, at the end of last year.

There has been relatively little change in railway motor coach ownership during 1934, the present situation being that approximately 75 Class I railways are operating about 4,500 motor buses, either directly, or through subsidiaries or affiliated companies.

Orders for Highway Vehicles

Railways, together with their subsidiaries and affiliated motor transport companies, ordered 302 motor coaches, 337 motor trucks, 27 tractors, 20 trailers and 45 passenger automobiles during 1934, according to replies received by the *Railway Age* in response to questionnaires seeking such data. Comparable 1933 figures are: Motor coaches, 106; motor trucks, 67; tractors, 2; trailers, 17; passenger automobiles, 37.

These data on highway vehicles ordered by railroads and their affiliates continue to be somewhat fragmentary. For example, vehicles ordered by contractors engaged exclusively in railroad work are not reported by the railroads and, as was pointed out last year, this has become a more important factor with the development of storedoor pick-up and delivery. Also, the accompanying statistics include no figures on orders placed by many of the bus and truck companies, which are listed in Co-ordinator Eastman's report of last year on the regulation of transport agencies, as being controlled directly or indirectly by railroads. And, finally, many sales to the railroads are made by local dealers and are therefore not known to the manufacturers who, in addition to the railways, receive questionnaires designed to aid in collecting the accompanying data and to check the figures received from purchasers.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended January 12 totalled 553,675 cars. This was an increase of 55,602 cars as compared with the week before, which included the New Year holiday, but it was a decrease of 3,591 cars as compared with the corresponding week of last year. As compared with 1933 it was an increase of 43,782 cars. Miscellaneous freight and forest products showed increases as compared with last year. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loadings

Week Ended Saturday, January 12, 1935

Districts	1935	1934	1933
Eastern	130,215	131,702	116,624
Allegheny	107,195	109,773	94,077
Pocahontas	40,276	40,579	37,478
Southern	82,545	82,925	80,623
Northwestern	65,835	63,898	57,394
Central Western	81,525	82,677	78,253
Southwestern	46,084	45,712	45,444
Total Western Districts	193,444	192,287	181,091
Total All Roads	553,675	557,266	509,893
Commodities			
Grain and Grain Products	26,276	29,554	30,558
Live Stock	15,347	17,771	18,161
Coal	131,930	138,297	118,809
Coke	6,875	7,300	5,589
Forest Products	19,920	18,175	14,094
Ore	2,901	3,218	2,424
Merchandse L. C. L.	150,468	158,547	159,005
Miscellaneous	199,958	184,404	161,253
January 12	553,675	557,266	509,893
January 5	498,073	500,813	439,469
December 29		425,120	454,765
December 22		547,895	531,464
December 15		579,935	559,419
Cumulative Total, 2 Weeks	1,051,748	1,058,079	949,362

The freight car surplus for the last half of December averaged 392,017 cars, a decrease of 5,646 cars as compared with the average for the first half of the month. The total included 228,404 box cars, 111,458 coal cars, 26,474 stock cars, and 9,912 refrigerator cars.

Car Loading in Canada

Car loadings in Canada for the week ended January 12 totaled 40,790 cars, as against 33,917 for the previous week, and 41,389 for the second week in 1934, according to the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
January 12, 1935	40,790	21,209
January 5, 1935	33,917	18,542
December 29, 1934	29,334	17,142
January 13, 1934	41,389	20,945
Cumulative Totals for Canada:		
January 12, 1935	74,707	39,751
January 13, 1934	75,751	39,736
January 14, 1933	59,408	32,065

Modernization of Passenger Service Recommended

Report of Eastman's section of transportation service urges better service, lower fares, and co-ordination

WASHINGTON, D. C.

A 272-page report on what's the matter with the railroad passenger business, including some far-reaching recommendations as to how its deficiencies may be corrected which appear likely to arouse a controversy of large proportions, was transmitted by Co-ordinator Eastman to the three Regional Co-ordinating Committees of the railroads on January 17 and made public on January 21. The report was prepared by the Section of Transportation Service, J. R. Turney, director.

Finding that the flight from the railways of two-thirds of their passenger business, or all of the increase they had experienced since 1900, is "due to failure to keep pace with modern methods of marketing, servicing, pricing, and selling," and that "present high fares are in large measure responsible for unprofitable rail operations," the Section not only recommends many important improvements designed to "modernize" the service, but also drastic reductions in the rates of fare to be charged, and the report is packed with ideas for creating an ideal service and making it easy for the public to travel by rail.

"To be made attractive," the report says, "passenger carrier service must be made as easy to procure as the daily paper, and as accessible as one's own car. A great majority of travelers to-day are not acquainted with the intricate routines, formerly considered indispensable to carrier transportation. These routines must be simplified for them, to the point of complete elimination. The only thing that should be required of a traveler is a telephone call expressing his wishes."

The report recommends abolishing the "tipping" system, saying the average passenger resents "extras," that porter service at stations and on coaches is indispensable to modern transportation, and that its cost should be included in the fare, because "all in all, the system is no small factor in making railway service unattractive."

It also says that "all arrangements for sleeping and other accommodations for the entire journey, regardless of the number of carriers involved, should be included in the initial travel contract, a single ticket covering all services, and at a single price," and that "the arrangements at the destination for hotel accommodations, or for being met at the station . . . can be made so much more surely, quickly, and economically by the carrier than by the individual, that the passenger has the right to expect this part of the job to be completed."

Classified Fares and Services Proposed

The fare for which a carrier can profitably furnish transportation, the report says, varies directly with the volume or density of travel. Actually and potentially by far the greatest volume lies in local journeys of less than 100 miles. The report proposes the European system of classified rates and services, with four basic classes ranging from 1½ cents to 5 cents a mile and quantity discounts for groups. Because of the volume available and the possibility of using less expensive equipment and facilities, a fare of 1½ cents is recommended for local service, intended to induce a public in which the dormant travel desire has been aroused by the automobile to leave its own cars at home occasionally and fill up the empty seats being hauled by the railways, or new and modernized ones to be acquired in some way. Even the 5-cent rate, for de luxe service, would represent a reduction because it is proposed to include a room and "all incidentals," and it is stated that the present average cost of a meal in a dining car of about $1.17 should be reduced to about 83 cents.

The lowest fare is said to represent the "fare ceiling" for local transportation, because "the bulk of travelers are now conveyed by private automobiles at a price which they believe to be about one cent per mile," with three passengers in a car. The replies of over 25,000 car owners to the "passenger ballot" questionnaire sent out by Mr. Eastman's organization over a year ago showed that the average cost per car mile of driving an automobile is 6½ cents, including depreciation, insurance, and overhead, and excluding those elements, 3 cents, but the report says that whether these costs are accurate is beside the point, because "they represent mass opinion of private car transportation costs," and that "however unscientific and foolish it may seem, the ordinary car owner cannot be persuaded that the distance trips which he takes increase the amount of depreciation, insurance and like costs."

Seemingly, therefore, the report contemplates that the mass-minded "commonalty" will continue to spend a large part of its income in advance for depreciation while it is new and shiny and that the railways must compete with the by-product of a car that otherwise costs its owner 6½ cents a mile, although the freight service can no longer support any by-products. A member of the advisory committee that was asked to criticize the preliminary draft of the report is quoted in a footnote as commenting that "mass opinion in the future will be affected by actual costs just as it is affected by the present rail high costs," while another was of the opinion that the report overlooks potential competition of the automobile and that to anticipate the future competition and create traffic the basic coach rate should be set at approximately one cent.

Incidentally the report includes some historical statistical tables showing, among other things, that in the years 1918 to 1923, before automobile competition had become important, the passenger revenues of the railways (over a billion dollars in each year), and the average per capita expenditures of the population for railway travel (ranging from $10 to $12 per year), were at their highest level at the time when the average fare was at approximately its highest point, increasing from 2.39 cents a mile in 1918 to 3.03 cents in 1923. In 1933

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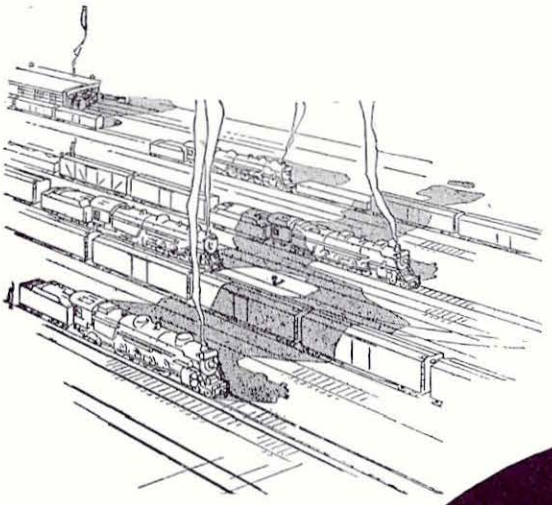

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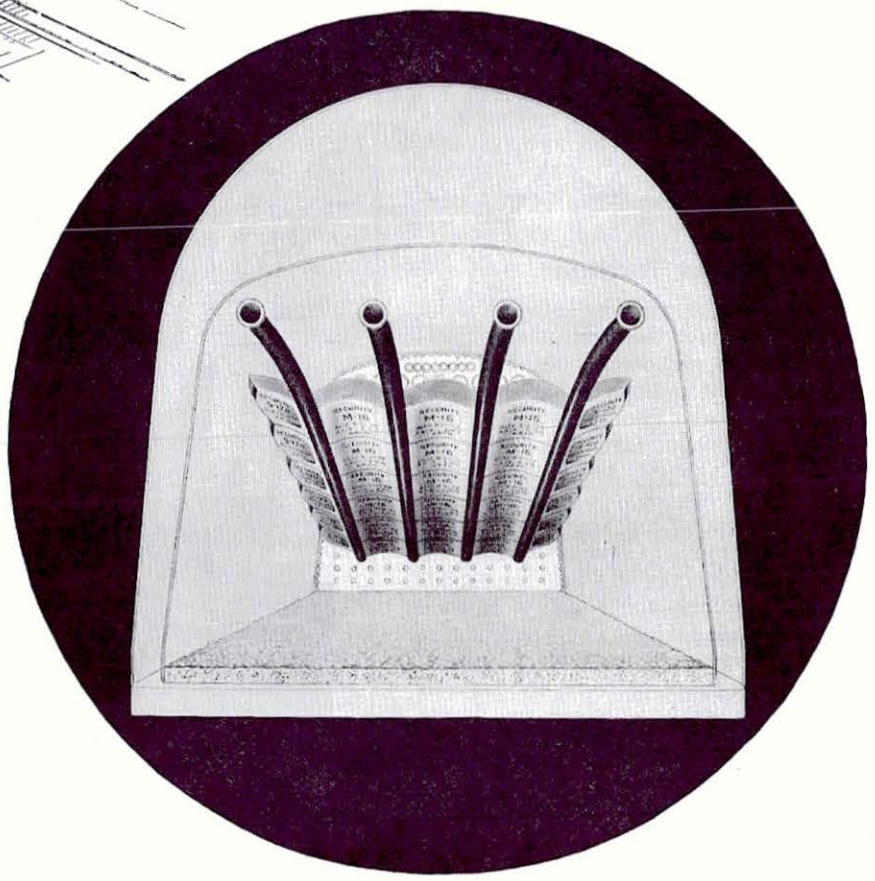

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the average fare was 2.02 cents, the per capita expenditure $2.62, and the passenger revenues $329,000,000.

The report discusses the highway bus not so much as a competitor of the railroads as an opportunity for them to reduce the cost of branch-line service. It shows that in 1933 the railroads handled 82 per cent of the carrier passenger revenues and 74 per cent of the passengers; that highway carriers handled 15 per cent of the revenues and 25 per cent of the passengers, and that the airway carriers handled 3 per cent of the passenger revenues. On the other hand it shows that while the automobile has wrested some 25 billion passenger miles from the railroads it has at the same time created additional travel of over 165 billion passenger miles per year.

"In the present unhappy state of the passenger business free service of any sort should be eliminated," the report says, but it suggests that perhaps employee reduced fares might be used during the transition from a free to a revenue basis. At the 1933 average fare the passenger transportation furnished gratis is estimated as equivalent to at least $50,000,000, or one-fourth the passenger service deficit.

Officers Believe Fares Too High

Seventy-two per cent of the railway officers who replied to a questionnaire indicated the opinion that present fares are too high and 56 per cent of the travelers who voted the passenger ballot indicated that the price of travel is a determining factor. The weighted average of their suggestions as to a proper fare was 1.91 cents a mile, while travel and sales agencies suggested 2 cents a mile.

After stating that the essential of any passenger carrier service is safety to the person of the traveler, the report says that "commendable progress has been made by the rail carriers in increasing the security of their patrons. When the modern devices and methods of operation, which are now quite generally employed, have been extended to all rail passenger carriers, the traveler will be as safe upon a railway train as in his own home, and much safer than when he is in his own automobile."

The conclusions and recommendations of the report are as follows:

CONCLUSIONS

Market

1. A major problem which challenges railway management is the unprofitableness of passenger train service—one of the most important branches of the business.

2. High tide in rail travel was reached in 1920. It receded precipitously from that time, accelerated by fare increases, development of highway travel, and economic depression, until in 1933, after a loss of two-thirds of the 1920 business, the 1900 level of passenger revenue and passenger miles was reached.

3. A vast and hitherto dormant travel desire aroused by the automobile, which has produced a travel market four times as great as the rail market at its zenith, indicates the volume possibilities which await a still more attractive and economical mode of travel.

4. Flight of passenger traffic from the railways is due to failure to keep pace with modern methods of marketing, servicing, pricing and selling.

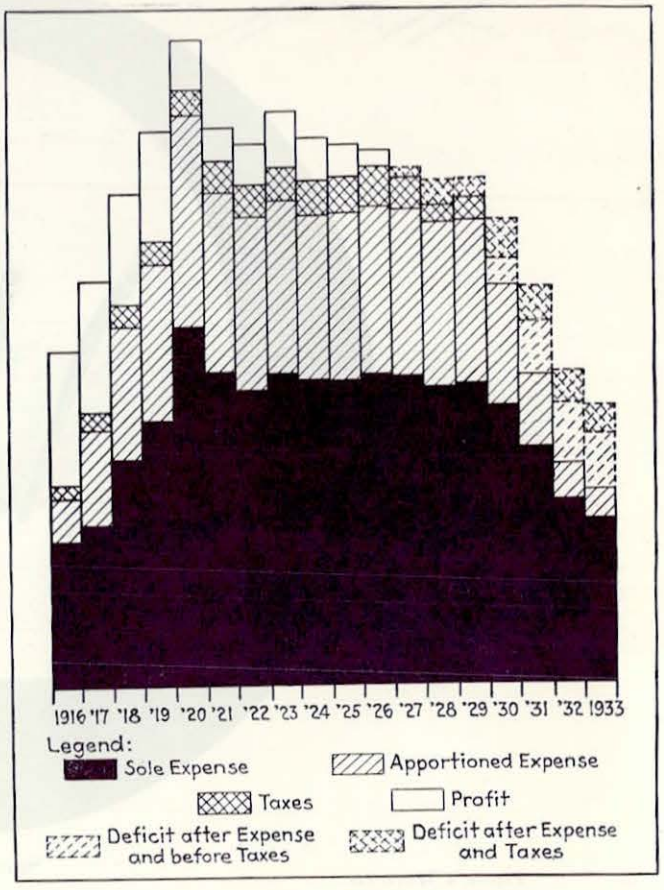
Servicing

5. To meet present-day travel requirements, carrier service should be: Safe; easy to procure and use; attractive; characterized by sincere and warm hearted hospitality; well rounded and complete in every detail, including city travel and transportation of private automobiles; convenient to use and unhampered by annoying routines; as comfortable as the traveler's own home; and finally, spotlessly clean and sanitary.

6. Passenger service should be intelligently designed to fit the individual needs of all classes of travel, but with full recognition that the greatest potential market lies in the vast majority of travelers who by necessity and choice are thrifty. *Suburban Service* should be frequent, speedy, and adjusted to the commercial and social habits of each large metropolitan area; *Local Service* should be governed by principles of mass transportation, frequent, but somewhat less so than Suburban Service, and also adjusted to the commercial and social necessities of the communities served; *Limited Service* should attract, by its economy, speed and continuity, the thrifty distance traveler, whose principal demand is complete, economical transportation; *Reserved Service* should attract those who want speed and modern conveniences at a reasonable price; and *De Luxe Service*, those who demand the highest type of accommodations and to whom price is less important.

Pricing

7. Present high fares are in large measure responsible for unprofitable rail operations, since they not only have put rail travel out of the reach of most people, but in many instances are more than the cost of travel by private automobile. The fare ceiling per passenger mile for local transportation is 1½ cents; for distance transportation, 2 cents; and for reserved accommodations and meals, 1 cent per mile additional.


1916 '17 '18 '19 '20 '21 '22 '23 '24 '25 '26 '27 '28 '29 '30 '31 '32 1933
Legend:
Sole Expense
Apportioned Expense
Taxes
Profit
Deficit after Expense and before Taxes
Deficit after Expense and Taxes

Passenger Traffic Income

8. A new and largely unexplored market can be reached by periodic, cheap *Excursions*, by *Quantity Discounts* for families, parties and habitual travelers, and by *All Expense Trips* and *Train Cruises*.

Selling

9. Railway sales promotion is deficient in several important essentials, particularly in pricing, sales direction, control and supervision, methods of contact, organization, and incitation to purchase transportation.

10. Continuance of eighty-nine passenger traffic organizations confronting one another is no longer warranted. Substantial economies are possible by modernization of railway pricing, tariffs and sales promotion.

Operations

11. Railway passenger service operating loss in 1933 was due: to a service lacking in popular appeal; to ineffective sales pro-

motion; and to preventable wastes in baggage service, in handling head end traffic, in duplication of terminal and station operations, in utilization of oversized power and equipment and of excessive and unnecessary number of cars in the trains, in improvident local train service, in competitive duplication of limited trains and sleeping and parlor car accommodations, and in the prodigal operation of dining and buffet services.

12. By modernization of servicing, selling, and operations, carriers can offer profitably a co-ordinated travel service more attractive and economical than now generally possible by private automobile.

RECOMMENDATIONS

Modernize Service

1. Ascertain, anticipate and satisfy essential requirements of travelers, for safe, clean, comfortable, complete, convenient, speedy and hospitable carriage, intelligently co-ordinated with city travel facilities, and with the transportation of the traveler's automobile.

2. Make rail travel suitable, intelligible and attractive to the commonalty, by eliminating intricate routines and tariffs; indifferent or discourteous treatment; hawking and panhandling; discontinuous journeys; noisy, unattractive, poorly arranged, and uncomfortable depots; infrequent schedules; inept equipment; and exorbitant prices.

3. Establish frequent, fast *Local Service,* co-ordinated (by contract, joint rates or arrangements) with highway carriers at a 1½ cent basic fare.

4. Establish for the thrifty distance traveler, frequent, speedy, intercarrier *Limited Service* at a 2 cent basic fare.

5. Establish for those, who want modern conveniences, at a reasonable cost, a high speed, intercarrier *Reserved Service* at a 3 cent basic fare, including berth.

6. Establish for the luxury traveler, a limited amount of high speed *De Luxe Service,* at a 5 cent basic fare, including room and all incidentals.

7. Establish *Quantity Discounts* from the standard charges for families, parties, traveling salesmen, lodges, schools and similar groups.

8. Develop pleasure, educational, sporting and other special event travel by *All Expense Trips, Train Cruises* and similar services.

Eliminate Waste

9. Consolidate functions of eighty-nine duplicate and competitive traffic departments into a single joint organization—such as the Association of American Railroads.

10. Eliminate complex, multifarious and unnecessary tariffs.

11. Consolidate and handle baggage, express and merchandise traffics in a distinctive class of service, utilizing passenger or freight trains whichever is best suited for the particular movement.

12. Eliminate the farming of reserved accommodation service, and provide for the exclusive operation of all reserved cars by railway companies; popularize sleeping and dining privileges as an integral part of *Reserved* and *De Luxe Services* and conduct them on a self supporting basis.

13. Unify stations and terminals, and reduce terminal switching.

14. Consolidate duplicate train services and reserved accommodations services, and stagger parallel train services.

15. Adapt the size and appointments of trains, power and vehicles to the particular service in which they are to be used.

16. Substitute highway transportation for rail *Local* and *Limited Services,* and airway transportation for rail *De Luxe Service,* wherever travel volume is insufficient to warrant the larger rail vehicles.

Promote Travel

17. Vest exclusively in the Association of American Railroads: market research and analysis; design and prescription of service, schedules and routes; pricing, tariff making and publication; and division and clearing joint revenues.

18. Charge the American Association of Railroads with sole responsibility for the re-creation of an American rail travel market, and specifically for a continuous, aggressive campaign of national and local advertising, good will, institutional, promotional and specific; and for the planning, conduct and supervision of the sale of passenger transportation.

Co-ordinate Transportation

19. Vest in the Association of American Railroads the function of, and charge it with full responsibility for, creating a single nationwide passenger service, by appropriately unifying railway facilities, terminals, equipment, trains and schedules, and co-ordinating, by contract or joint rates and arrangements, railway, highway, airway, and waterway transportation.

Synopsis

The following is a brief synopsis of the report:

Unprofitability. Passenger service on the whole was unprofitable. The air lines broke even; the buses earned a slight margin above cost, but an inadequate investment return; and the railways expended 200 million dollars more for the service than the revenues of 500 millions which it produced. Of the latter loss, 90 million dollars was suffered in handling baggage and express; 60 million in handling coach passengers; 30 million in handling sleeping and parlor car passengers; and 33 million in dining car services. Expressed differently, main line trains lost 187 million dollars and branch line trains, 16 million dollars; or still differently, limited trains lost 82 million dollars; local trains, 84 million dollars; suburban trains, 13 million dollars; and other trains, 20 million dollars. Baggage and express traffic losses were due largely to operating methods and equipment used; passenger traffic losses, partly to operating methods, partly to equipment, and to low traffic volume.

Travel Volume. Railway travel was no greater in 1933 than in 1900. Measured by per capita expenditure, it was less than in any year since 1871. In 1933 travel between cities in private automobiles was ten times as great as in trains, and aggregate travel per capita by all means of transport was four times as great as it was prior to the automotive era. This contraction in railway travel and the concurrent expansion of all travel was largely due to the private automobile, which offers a service more attractive in its simplicity and freedom from red tape, in courtesy and hospitality en route, in free movement uninterrupted by train or depot transfers, in ease and facility in arranging for accommodations en route and at destination, and at a price which generally is much cheaper than rail fares. The increase in travel as a whole indicates that at least three-fourths of those who now travel do so from desire rather than necessity, which emphasizes the need for carriers to improve service and reduce fares.

Improved Service. Carriers should make it possible for travelers to arrange for their journeys by telephone, and upon request, should deliver tickets, arrange for cab service, collect and deliver luggage and transport the traveler's automobile for use at destination. Carrier service should be humanized, made hospitable and travelers should be welcomed as guests. Carrier depots should be more restful and comfortable and less ostentatious and forbidding. Ticket routines and handling should be simplified. Carrier equipment for distance journeys should be air-conditioned, made roomier and equipped with conveniences and comforts of the ordinary home. From the traveler's standpoint, the service should be unified by operation of joint depots at all common points of intercarrier trains, so that wherever possible, delay, annoyance and inconvenience of train or depot transfers will be avoided.

Reduced Fares. Because of the volume and the possibility of using less expensive equipment and facilities, a fare of 1½ cents per passenger mile is recommended. Because of the relatively smaller volume and more commodious equipment and accommodations required for distance travel, a fare of 2 cents per mile is recommended. For berth or seat travel in sleeping or parlor cars, a fare, inclusive of such accommodations, of 3 cents per mile; and for luxury travel in high-speed, de luxe trains, consisting of private bedroom, lounge, club,

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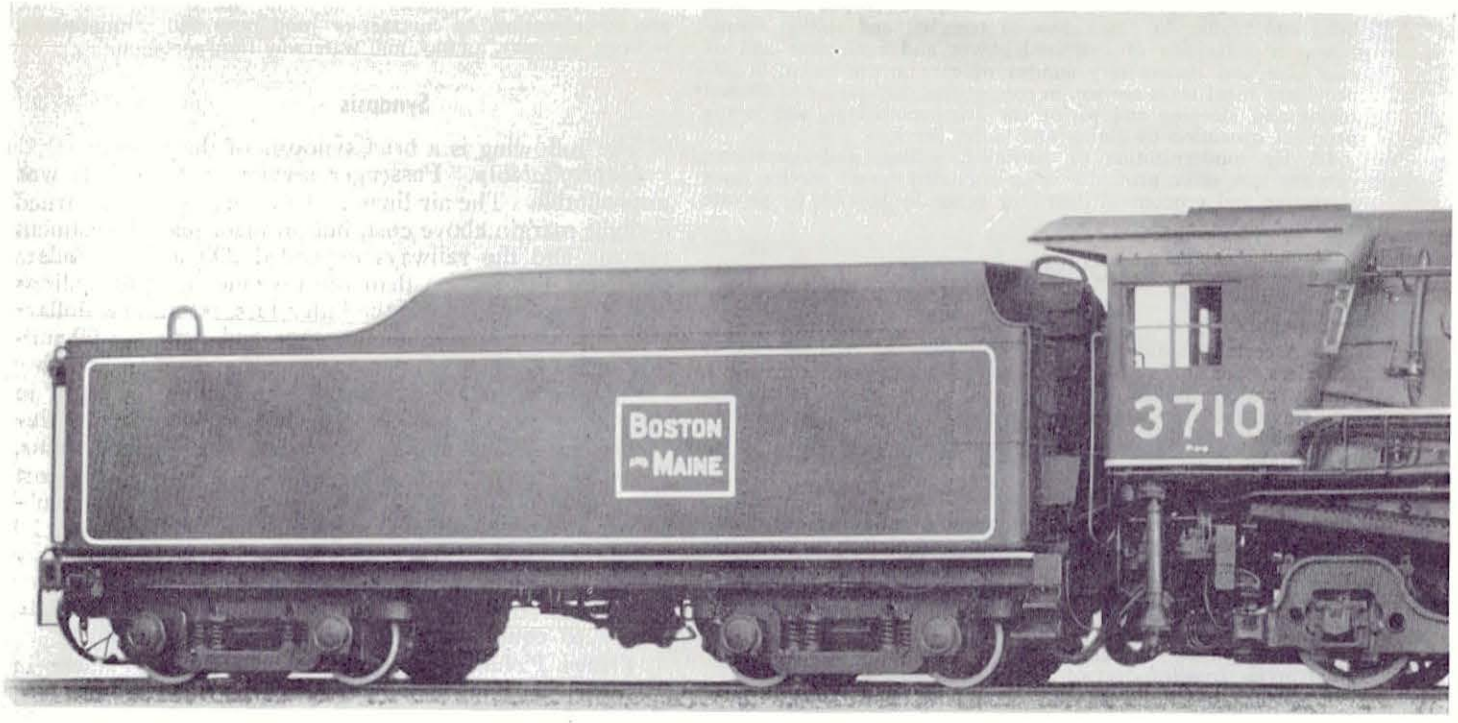
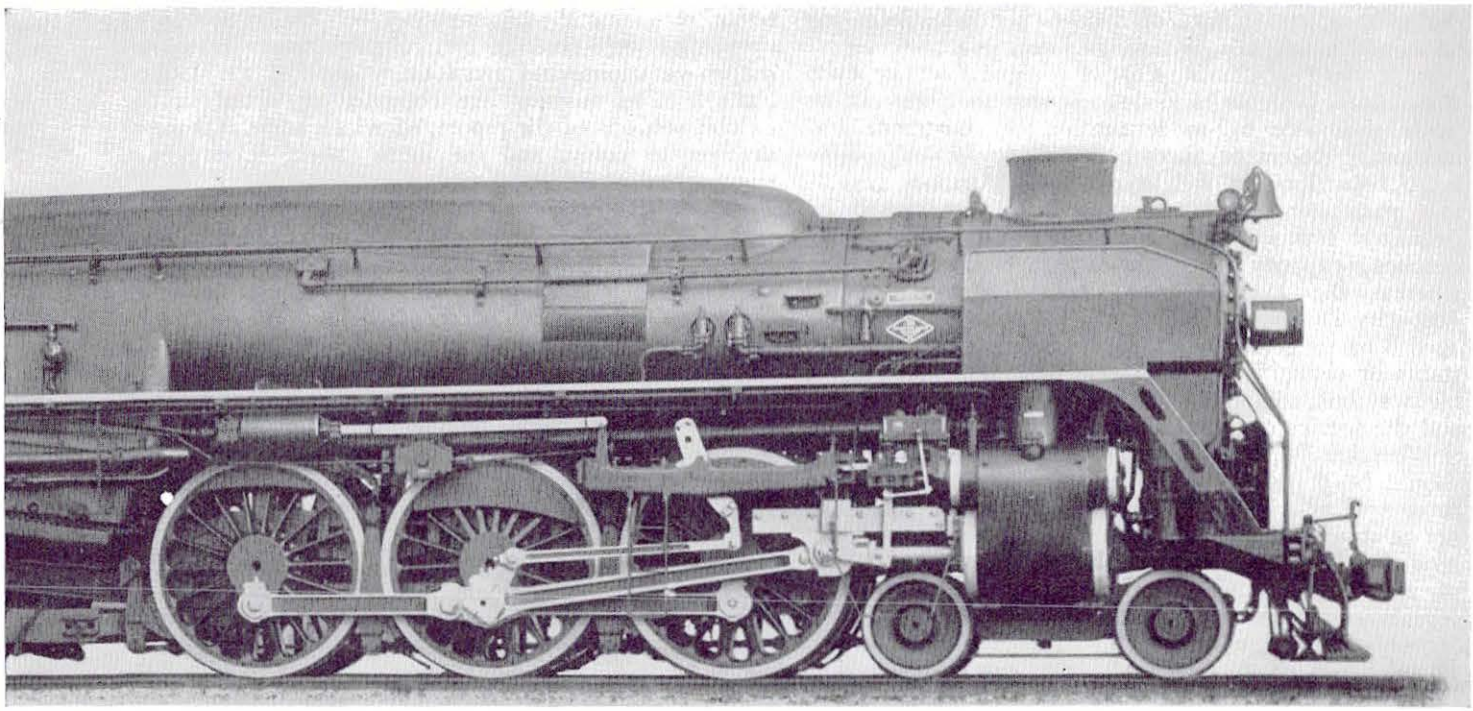


WEIGHT IN WORKING ORDER, POUNDS				
On Drivers	Eng. Truck	Trailer Truck	Total Engine	Tender Loaded
209500	61400	68300	339200	240300

WHEEL BASE			TRACTIVE POWER	
Driving	Engine	Engine and Tender	Main Cylinders	With Booster
14'-0"	36'-11"	77'-7"	40900	52800

BOILER		CYLINDERS		GRATE AREA 66.9 Sq. Ft.
Diameter	Pressure	Diameter	Stroke	Driving Wheel Dia.
75¾"	260 lbs.	23"	28"	80"



These Pacific Type Locomotives

for the Boston & Maine Railroad,

are specially designed for heavy

high speed passenger service.

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dining cars, etc., a fare of 5 cents per mile, including room and incidentals, is recommended.

Improved Operations. Carrier passenger service, even when traffic volume is as low as that in 1933, can be made profitable by modernization of equipment and methods. Recent advances in metallurgy make possible large reductions in weight of cars. Analysis reveals that passenger deficits were in large part caused by oversized trains. The average occupancy of railway coaches (capacity 77 passengers) was 14 passengers, whereas the average occupancy of highway buses (capacity 28 passengers) was 16. Pullman cars averaged 8 passengers per car. By reducing the cars in the trains or changing from a steam to a motor train or a highway bus, equipment can be adapted to traffic volume and the service operated at a profit.

Wasteful Duplication. Express and baggage traffics should be consolidated with merchandise traffic. The three traffics which now require 2½ billion car miles per annum can be handled in the ½ billion car miles now devoted to express and baggage alone. Analysis of all limited trains and Pullman car lines in 1933 reveals unnecessary duplication of service, which accounted for 75 million dollars of the passenger deficit. Farming out of sleeping and parlor car serves to The Pullman Company resulted in unnecessary cost of at least 6 million dollars, which would be avoided and the service improved by acquisition of Pullman operations by the railways, which is recommended.

In his letter to the co-ordinating committees Mr. Eastman said:

Co-ordinator Eastman's Comments

After reading the report, I am impressed—as I hope you will be—with the great opportunities for the re-establishment of railway passenger service upon a profitable basis, which apparently lie in improved service, modernized equipment, co-ordination of facilities and services, elimination of wasteful methods, and in co-operative and aggressive pricing and selling.

The report, which is necessarily critical in form, deals with the present deficiencies in the service, and how they can be corrected. I trust that you will not allow minor and controversial matters (such as tipping and passes) nor the feasibility of the particular remedies suggested, to play too large a part in its consideration but that you will cause attention to be concentrated upon the solution of the problems, the gravity of which is a challenge to the best intelligence of the industry.

A letter from a member of the informal Advisory Committee comments that some of the conclusions "reflect the feeling of a writer who is more inclined to be interested in things as they should be, rather than in things as it is practical to make them." To my mind, that is one of the merits of the report, for it is astonishing how often the impractical can be converted into the practical, given the will to do it.

Until you have had the opportunity to study and comment upon the report, I shall hold my mind open with respect to its conclusions and recommendations, but I am quite clear that passenger service should not be considered and dealt with as an unavoidable but unwanted step-child of railway operation, nor as one necessarily unprofitable. The travel habits of the American public have been tremendously stimulated in recent years and are capable of much further stimulation. It is quite possible for the railways to participate in this development and thereby share in the benefits. I am hopeful that the report will be considered as an attempt to further such a movement rather than mere captious criticism.

Mr. Turney and his assistants will be available, in the event that you wish to consult with them in regard to any of the matters covered by the report.

What Travelers Want

The passenger ballot was designed to develop traveler opinion of present-day transportation service. Over 175,000 copies were distributed among members of automobile clubs (10 per cent of the membership of each club); to passengers on railway trains, highway buses and airplanes; to sales managers for distribution among their traveling salesmen; and to travel bureaus for distribution among their patrons. Over 26,000 replies to this ballot were received and compiled, representing all major vocations, and from every part of the United States. The answers are compiled in detail in the exhibit sections of the report, of which some 500 pages are yet to come, and the more salient features are summarized in statistical analyses.

All of the replies indicated the relative weight of travel inducements in selecting a transportation agency as follows: Convenience, 74 per cent; comfort, 68 per cent; speed, 58 per cent; cost, 56 per cent; safety, 56 per cent; scenery, 30 per cent; completeness, 23 per cent; habit, 10 per cent, and prejudice, 6 per cent.

Of those who replied to the passenger ballot, 22,421 (excluding the 3,978 traveling salesmen) reported 190,054 miles of travel in the year ended October 1, 1933. Of this, 59 per cent was by private automobile, 33 per cent by rail, 2 per cent by highway carrier, 4 per cent by air, and 2 per cent by water.

An inquiry addressed to railway traffic officers, seeking suggestions for improvement of railway service, pricing, and selling, was answered by 664 railway officers, whose replies are abstracted in detail in the appendices.

An inquiry was addressed to the sales managers of representative industries, seeking information about the motorization of their sales staffs, and opinions with respect to railway passenger problems. Replies from 473 sales managers, together with 144 replies from similar inquiries addressed to executives of advertising agencies and editors of representative newspapers and magazines are abstracted. A similar inquiry, supplemented by questions dealing with their own particular activities and operations, was addressed to all American travel bureaus, from which 181 replies were received, which are abstracted in the appendices.

The 26,399 travelers who replied owned 26,607 automobiles. Seventy-three per cent of the travelers and 86 per cent of the officers wanted air-conditioned equipment; 49 per cent of the travelers wanted shock-proof equipment; 31 per cent asked for facilities for the transportation of private automobiles on passenger trains, 51 per cent for station parking facilities; 45 per cent for destination storedoor service; 45 per cent for intelligible timetables; and 43 per cent for intelligible train announcing; 56 per cent wanted clean, sanitary stations and cars. Fifty-two per cent of the travelers wanted tipping abolished and 48 per cent asked for station porter service, but there is nothing to indicate whether any of them wanted to tip the porter.

Seventy-four per cent emphasized convenient schedules as a determining factor; 58 per cent mentioned high speed (an average of 58 miles an hour, over-all), while only 56 per cent of the railway officers did so. Sixty per cent of the travelers and 50 per cent of the railway officers voted for streamlined trains. Sixty-five per cent of the travelers voted for cheaper private rooms; 40 per cent for recreation cars; 39 per cent for radios; 27 per cent for telephone service; 58 per cent for cheaper diner prices, and 54 per cent for lunch counters; 43 per cent for windows in upper berths.

Sixty-four per cent of the travelers said that excursions create travel. Seventy-three per cent of the railway officers and 74 per cent of the sales agencies said that mileage books would be desirable, but only 40 per cent of the travelers. Only 36 per cent of the railway officers indicated by their replies an opinion that the present organization of the carriers for sales promotion is effective. Eighty-six per cent of the travelers indicated that the advertising of the railways is not as effective as that of their competitors.

Mr. Turney, in his memorandum to the Co-ordinator, said:

Mr. Turney Says Report Not Intended as Indictment

In a study—the primary objective of which is constructive criticism—it is difficult to avoid becoming hypercritical. The report is not intended as an indictment of carriers or of their management. In a small field, I have done many of the very things which the report criticizes. The situation is not peculiar to this industry. A similar survey of almost any business would reveal like conditions of disservice.

The report was made possible only by the co-operation of railway, highway and airway carriers, who expended much time and money in order to collect and compile the underlying data. Upon the part of the highway and airway carriers, and The Pullman Company, these expenditures were wholly voluntary. The assistance of the National Recovery Administration and of the Highway and Airway Code Authorities was helpful in enlisting the co-operation of these carriers.

Marketing, pricing, and selling data were compiled under the direction of Mr. E. M. Johnson; statistics of operation of all carriers, under the direction of Mr. A. F. White; of airway services, by Mr. F. DeWolfe Sanger; analyses of duplication in limited train and reserved services were made under the direction of Mr. Walter Bockstahler.

Messrs. W. M. Daniels and Kent T. Healy, Yale University; Dr. G. Lloyd Wilson, University of Pennsylvania; Messrs. C. E. Wickman, Greyhound Corporation; A. M. Hill, Motor Bus Code Authority; C. McD. Davis, Atlantic Coast Lines; L. C. Probert, Chesapeake and Ohio; George B. Haynes, Chicago, Milwaukee, St. Paul and Pacific; M. M. Goodsill, Northern Pacific; H. F. McCarthy, Boston and Maine; and J. M. Symes, Pennsylvania; were good enough to act as an informal Advisory Committee. Their criticisms of a preliminary draft of the report were exceedingly helpful and constructive. Some of their comments are mentioned in the notes, but nothing herein should be construed as indicating their concurrence, either in the facts stated, the conclusions, or the recommendations, responsibility for which must be solely assumed by the Section of Transportation Service.

Railroads Disagree as to Passenger Fares

SHARP differences of opinion among various railroads as to the proper basis of passenger fares, reflecting differences in the character of the traffic of the different companies, have been brought out at the hearing before Commissioner Porter and Examiner Koch of the Interstate Commerce Commission in connection with the commission's investigation of passenger fares and surcharges, which began on January 16 at Washington. The principal difference is between the eastern roads and those in other parts of the country but there is also a wide gulf between the opinions of some of the eastern lines, whose testimony was given in the first days of the hearing, and it is understood that other disagreements will be shown among the western and southern lines.

Eastern Railroads Differ

One of the big issues to be considered is as to whether there should be a uniform basic rate of fare for the entire country. The eastern lines in general say "no" to this. Another question is whether the basic rate of 3.6 cents a mile in the East is too high, especially since the southern and western lines are experimenting with lower basic rates. The New York Central, the Pennsylvania and the New Haven are strenuously endeavoring to retain the present practice of keeping up the basic rate wherever possible and making numerous special reductions for excursions, conventions, etc., which have brought down the average rate in the East to a point approaching that in other territories. The Baltimore & Ohio, however, insists that it is necessary to reduce fares generally if the railroads are to stay in the passenger business and has proposed rates of 2 cents in coaches, and 3 cents in Pullman and sleeping cars, with 2½ cents for round trips, without surcharge.

Commissioner Porter has made it plain from the outset that he is strongly in favor of a reduction in the basic rates in the East and has argued vigorously with witnesses who opposed the idea that a lower rate would greatly increase travel by filling empty seats without increasing operating expense.

The position of the eastern roads generally was outlined by C. A. Fox, chairman of the Central Passenger Association.

In respect to the question whether maximum or minimum fares may vary with each major rate territory, he said, it is the view of the eastern railways that, properly, there may be a variation in basic fares in the different rate territories. However, if carriers in certain rate territories deem it necessary to establish basic passenger fares in an experimental or other effort to revive travel by train, the voluntary acts of such carriers in setting up such bases should not be taken as a criterion to determine what the passenger fares should be in the eastern region. The eastern railways maintain that their passenger fares must be judged by conditions in their territory. It must be emphasized that about two-thirds of the total passenger revenues of the country accrue to the eastern railways.

The eastern railways also wish to express the opinion that it would be practicable for one region to maintain a higher basis of fares than contemporaneously in effect in another region and that if, for example, a higher basis were applicable in the eastern region it could be maintained for a very predominant part of the traffic having both origin and destination within the boundaries of the eastern territory and, as well, on a considerable percentage of the total of interterritorial travel. Any such wide disparities as exist today would have a materially disturbing effect on quite a volume of travel in the eastern region, unless the eastern lines withdraw from business competitive with lines in other territories.

The Question of Special Reductions

Mr. Fox described in detail the many special reductions made by the eastern lines and said that, irrespective of whatever day-to-day basic fare may exist, the continuation of low special fares will be important and desirable and that "there should not be taken away from them by the declaration of a minimum fare stipulation the privilege of creating travel which cannot be stimulated to move except by medium of the various classes of excursion fares, from which they derive millions of dollars annually, and the fares for a number of which are lower than any daily basic fare schedule that might reasonably be fixed."

D. M. Bowman, passenger traffic manager of the New York Central Lines, said a reduction in the basic rate would not stimulate enough traffic to offset the loss in revenue, and when Commissioner Porter said the railroads reduce freight rates to stimulate business, he retorted that they reduce rates on particular commodities or between particular points to meet conditions and that special reductions in passenger fares are made in the same way.

Commissioner Porter, referring to the low average of passengers per car, insisted that they could be filled without costing the railroads a cent more, but Mr. Bowman replied that the average is brought down by branch line trains and that additional traffic would not be so

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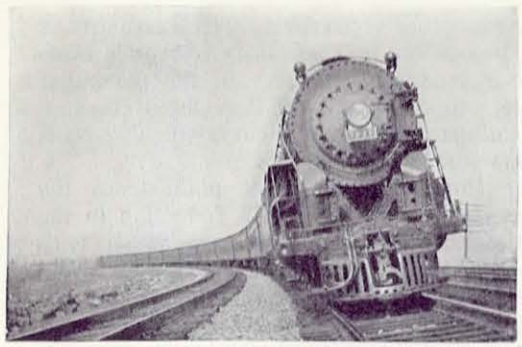

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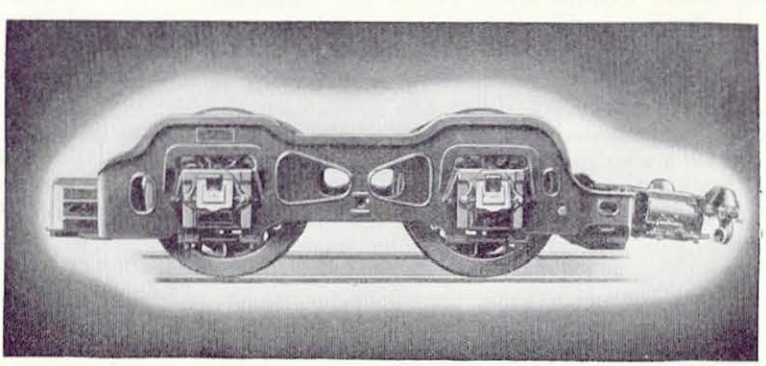

Improvement Budgets . . .

Remember!

Passenger train equipment has always been a step ahead in the luxury of its appointments.

Now air conditioning further adds to the attractiveness of Railroad travel by providing more comfort.

But these efforts and expenditures will be useless and largely wasted unless the train is handled smoothly, unless schedules are maintained. Regardless of how operated, air conditioning equipment calls for additional power capacity from the locomotive.

To insure smooth starting, quicker acceleration to road speed and high speeds between terminals, The Locomotive Booster is a necessity on such equipment.

To maintain the drawbar horsepower required for a normal train and to compensate for the power required for air conditioning, be sure The Locomotive Booster is included in making up budgets for air conditioning.

No locomotive device is better than the replacement part used for maintenance. Genuine Franklin repair parts assure accuracy of fit and reliability of performance.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

evenly distributed as to use the present empty space without requiring additional trains. Mr. Porter also said that the maintenance of the higher basic fare penalizes the business man who has to travel on a particular day. When Mr. Bowman admitted that with sufficient volume the railroads could carry passengers at half a cent a mile, as they sometimes do, but said that it would be impossible to get such a volume day in and day out, the commissioner asked: "How do you know? You have never tried it, have you?"

F. W. Conner, assistant passenger traffic manager of the Pennsylvania, said the problem in eastern territory is vastly different from that in the West and South and that the basic fare should be established primarily in relation to those lines to which passenger traffic is a major consideration. He said that in 1933 the Pennsylvania's $70,000,000 of passenger revenue was 21.7 per cent of its total revenue and that "we have no moral right to reduce the basic fare under present conditions when there is so great a responsibility to protect the financial structure that makes the operation of the railroad possible.

It was his profound conviction that the total passenger revenue today is higher with the existing basic fare, with special reductions made to stimulate travel, than it would be with a lower basic fare, because of the large volume of high-class business travel between principal cities. Of the $48,000,000 passenger revenue of the Pennsylvania exclusive of commutation revenue, he said $14,000,000 was represented by travel between New York and Washington and $18,000,000 by that between principal eastern and western cities, a total of $32,000,000, of which about 52 per cent was Pullman travel that paid the surcharge, "and no reduction in the fare structure that could fall within the realm of reason could possibly have induced any appreciable increase in travel of that nature."

Don't Dare Gamble

"We do not regard the present fare structure as the last word," he said, "but we feel that we should hold fast to what we have now because we don't dare to gamble where the factors are so large and the need for gross revenue so urgent, under present conditions. When business conditions are better and we have a backlog that will enable us to experiment, we will actively endeavor to come to an understanding with our principal associates to determine what changes might be desirable. The present fare structure is entirely reasonable and lawful. The Pennsylvania has not refused to consider the expediency of a reduction in fares.

"In the past four years," he continued, "we have repeatedly and constantly considered from all possible angles the effect that various reductions in fares might be expected to produce and we believe we could not in conscience, without violating our best judgment, make any reduction in the basic fare at this time. Conditions in the South and West are different. There is no analogy between their situation and the great bulk of our kind of traffic. The necessary corollary of a relatively high basic fare is, of course, a flexible scale of special or excursion fares. Our over-Sunday excursion fares produced $3,000,000 of revenue a year from created traffic that would not move by any other form of transportation. We believe we are making a greater contribution to the country by keeping our company solvent and giving good service."

In reply to a question, Mr. Conner said that the Pennsylvania handled roughly 85 per cent of the passenger business between New York and Washington and the Baltimore & Ohio about 15 per cent. Asked if the railroads could not attract traffic from the automobiles by reducing rates, Mr. Conner said that a very low coach fare might attract some of such traffic but that even the children of railroad officials who can ride on the railroads free "to a foolish and regrettable extent insist on riding in father's automobile."

A. H. Seaver, passenger traffic manager of the New York, New Haven & Hartford, also expressed the conviction that a reduction in the basic passenger fare would not increase passenger revenues.

Argues for Lower Basic Fare

The argument for a lower basic fare was urged by W. B. Calloway, general passenger traffic manager of the Baltimore & Ohio, who said the loss of passenger traffic by the railways has reached a point where something must be done about it, without waiting for prosperity to return, or it will be necessary to discontinue passenger service on thousands of miles. He said the B. & O had tried almost everything else, including improvements in service and reduced special rates and that he had reached the conclusion that "we have our product priced wrong to sell it." He recognized that other roads may have a different problem but thought that reduced fares would be the salvation of the B. & O. passenger business and that traffic would be easily increased thereby.

Mr. Calloway felt that the price of railroad passenger service is definitely out of line and that "we have got to put our business on the basis of commercial life, price our product right and use salesmanship and promotion. We must find the basic fare where public resistance will be removed. The coach fare should be a necessity fare, to compete with the highway transportation and attract second-class travel and when you eliminate the surcharge as such you will eliminate an aggravation which irritates people more than the amount." He said that the present basis must be considered entirely reasonable because it is less than the cost of producing the service, but that it "is not a salable price." J. E. Benton, general solicitor of the National Association of Railroad and Utilities Commissioners, tried to get Mr. Calloway to say that the present rate is unreasonable from the value of service standpoint but he declined to enter into a legal argument. With a reduced basic rate, he said, many special rates below the new basis could be taken out and perhaps the "charity" rates could be placed on a basis of two-thirds instead of half of the regular fare.

H. W. Siddall, chairman of the Western Passenger Association and the Transcontinental Passenger Association, after describing the experiments with special fare reductions made by the western roads, said that the experiment begun December 1, 1933, with a coach rate of 2 cents a mile, a rate in parlor and sleeping cars of 3 cents without surcharge, and a round-trip coach rate of 1.8 cents, had shown encouraging results, although not finally determinative as to what the exact rate ought to be. The experiments had indicated that the rate is the determining factor, he said, and also that a higher charge for Pullman and parlor cars is proper and does not create discrimination, because the Pullman travel has increased more than the coach travel, but he said that carriers should be permitted to use their own initiative in determining the rates best suited to the conditions and no maximum or minimum should be prescribed by the commission. The rate depends a great deal, he said, on the ability or willingness of the public to pay and the railroads should be permitted to meet the competition of busses so long as they are not regulated and the rate should be sufficiently flexible to meet all conditions, including the private automobile.

An adjournment was taken on January 21 to February 13.

NEWS

Cost of Labor Proposals Put at $1,250,000,000

R. V. Fletcher thus estimates the financial effects of seven bills in Congress

An estimate that the seven bills introduced in Congress as the legislative program of the Association of Railway Labor Executives would increase railroad operating expenses by approximately $1,250,000,000, without any increase in efficiency, service, or safety, was given by R. V. Fletcher, general counsel of the Association of American Railroads, in an address before the Western Fruit Jobbers' Association at San Francisco on January 23.

"It is impossible to say just how much the enactment of these bills would increase operating expenses," he said, "but it is well within the bounds of conservatism to say that the added cost would amount to one and one-fourth billion dollars, which is roughly twice as much as the burden of fixed charges now resting upon the industry."

Mr. Fletcher said that the federal coordinator of transportation recently estimated that the six-hour day bill alone would, under present day employment conditions, add $400,000,000 to railroad expenses. "Our figures indicate," he added, "that on the basis of employment prevailing in 1930, the addition would be $547,000,000, which is more than the total for that year of the interest paid by the roads on their entire funded and unfunded debt. The train limit bill will cost $200,000,000 additional and the full crew bill, another $83,000,000. The cumulative effect of passing these three bills, in addition to the effect of passing each one separately, would be still another $100,000,000 added cost. Assuming a return to the 1930 traffic volume, here are three of these proposed bills that will add $930,000,000 to the cost of operation. The other objectionable measures will, I feel sure, bring the total above the figure I have mentioned.

"I wish it were possible to ignore or forget this threat by organized labor to the integrity of the industry. I am sincere in this expression because I realize the help railroad management is receiving from organized railroad labor in the matter of equality of treatment for all forms of transportation. For that assistance cheerfully and enthusiastically extended, I am grateful. But any treatment of railroad problems is obviously short-sighted and incomplete if it omits all consideration of this threat to the integrity of the industry —a threat which, if fulfilled, will destroy all our efforts looking toward recovery in the field of transportation."

Establishment of a co-ordinated system of transportation "in which each agency shall be called upon to perform that type of service which it is best suited to perform with due regard to standards of safety, efficiency and economy" was urged by Mr. Fletcher with a view of according all forms of transportation equality of treatment.

"I can see no objection to dividing the regulating commission into sections or divisions, one handling railroad matters, another highway matters, and a third, questions that may arise as to water traffic. Given some machinery for co-ordinating the activities of these sections, when confronted with problems common to more than one form of transportation, such an arrangement would seem to be logical and practicable enough."

He called attention to the fact that the railroads had recently organized the Association of American Railroads, equipped to handle all problems that may arise in the Operating, Traffic, Accounting, or Law Departments, and also with a department designed to make searching inquiry as to improved modern methods of operation. "These several departments," he added, "functioning severally and collectively under able leadership, should certainly be given the opportunity to demonstrate what can be accomplished by self-regulation in the public interest."

Regulations for Railroad Tax Returns

The Bureau of Internal Revenue has issued a pamphlet of regulations governing the filing of consolidated income tax returns by affiliated railroad companies.

Annual Dinner of Chicago Traffic Club

The twenty-eighth annual dinner of the Traffic Club of Chicago will be held at the Palmer House, Chicago, on February 7.

President to Send Transportation Message to Congress

President Roosevelt on January 23 announced that he would send to Congress at an early date a message dealing with transportation legislation, probably following one next week on aviation.

Railplane Now on G. M. & N.

The Gulf, Mobile & Northern has leased the Railplane, a streamlined motor rail car, from the Pullman-Standard Car Manufacturing Company and is operating it between Tylertown, Miss., and Jackson, the car making a round trip daily. This car was described in the *Railway Age* of October 7, 1933, page 489.

Zero Hour for Railroads as Private Enterprise

Problem never so important, difficult and dangerous as now, says Samuel O. Dunn

"This is the zero hour in the history of our railways as a private industry," declared Samuel O. Dunn, editor of the *Railway Age* and chairman of the *Simmons-Boardman Publishing Corporation*, in an address at the annual dinner of the Winston-Salem Traffic Club at Winston-Salem, N. C., on January 22. "I have studied the history of transportation and been in as close contact as any man with railway affairs in this country for more than 25 years, and I warn the American people that our railroad problem never was so important, difficult and dangerous as now. The right solution of it in the public interest is plain. The problem is so difficult entirely because powerful selfish factions are determined to have it dealt with in their interest regardless of the public interest.

"The railroads are between two fires from many business men and organized labor, both classes of whom, consciously or otherwise, are trying to force the railroads into bankruptcy and permanently destroy their earning capacity. The policies of both, whether they know it or not, are essentially communistic. Communists advocate the destruction of private property by force. It can also be destroyed by abolishing its earning capacity, because no private owner would retain property thus rendered valueless.

"The danger of government ownership of railways has never been due to its advocacy. The danger of it has always been due to policies tending to destroy the railways' earning capacity, and thereby to make it necessary for the government to assume their ownership and management. Certain business interests and leaders of labor unions, inspired by the most selfish motives and acting in entire disregard of the grave political and economic consequences to the public, are tunneling in opposite directions to undermine and destroy the earning capacity of the railways, and thereby their private ownership. The public should effectively assert itself against both for its own protection.

"The railways ask only that government policies shall be applied to transportation similar to those that every other industry asks shall be applied to it. They ask abolition of present unfair competition due to government policies which strictly regu-

(Continued on page 181)

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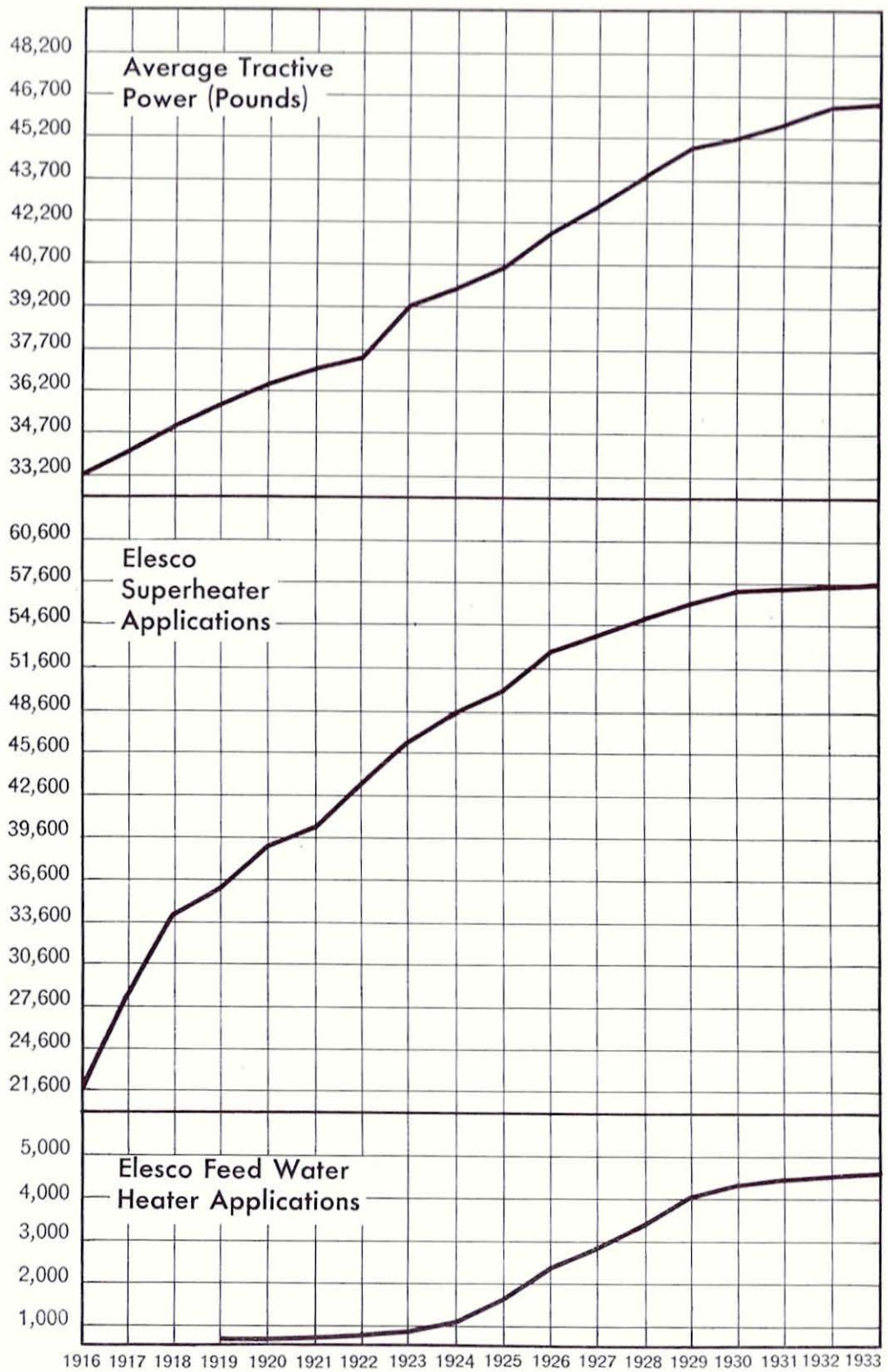
Average Locomotive Tractive



ELESCO

Power Moves *Upward* . . . *with* Elesco Capacity–increasing Equipment

A DETERMINING factor in the earning capacity of the railroads of the United States is the hauling capacity of the locomotives . . . for, in general, as more powerful locomotives are used in road service, the more economical will be railroad operation.

Striking evidence of steady improvement in this vital factor of railroad operating efficiency is shown by the continuous upward movement in average locomotive tractive power for many years. From 1916 to 1933, the average tractive power has been increased from 33,188 lb. to 46,500 lb. . . . . an increase of 40 per cent. The 1933 figure (the latest available) represents the highest point yet attained.

It is significant that this continuous improvement has parallelled the constantly increasing proportion of locomotives equipped for superheating and feed water heating . . . . both important factors for improved operation by providing greater hauling capacity upon a more economical fuel rate.

This upward trend of locomotive improvement can be continued only as the railroads are enabled to take full advantage of the locomotive improvements now available.

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, Inc.

60 East 42nd Street
NEW YORK

Peoples Gas Building
CHICAGO

A-944

Canada: The Superheater Company, Limited, Montreal

Superheaters *Feed Water Heaters* *Exhaust Steam Injectors* - *Superheated Steam Pyrometers* *American Throttles*

Bill Would Broaden R.F.C. Power to Make Rail Loans

Other administration proposal would extend maturity date limit to January 31, 1945

Administration bills to extend for two years the loaning power of the Reconstruction Finance Corporation, which under the present law expires on January 31, to authorize it to make loans with maturities up to January 31, 1945, and to clarify and broaden its powers to make railroad loans, were introduced in Congress on January 18 by Senator Fletcher, chairman of the committee on banking and currency as S. 1175 and by Representative Steagall, chairman of the House Committee, as H.R. 4240. An official explanation which accompanied the bill is in part as follows:

SECTION 3

This section of the draft bill would permit the Corporation to make loans for sufficiently long periods to enable borrowers to repay the Corporation without the drag on business activities which might be attendant upon too rapid utilization of capital for such repayments.

Section 3 of the draft bill provides for loans or advances or renewals or extensions thereof to mature not later than January 31, 1945, instead of February 1, 1940, as under existing law.

This section contains a provision that as a condition of making loans to railroads or railways, or purchasing the obligations thereof, for a period longer than 5 years the Corporation may requre:

"That such arrangements be made for the reduction or amortization of the indebtedness of the railroad, either in whole or in part, as may be approved by the Corporation after the prior approval of the Interstate Commerce Commission."

This proviso is considered to adequately protect the Corporation's interest in connection with these long-term loans, and is in accordance with the plan for the scaling down of the debt structure of railroads and railways approved by the President.

SECTION 4

This section of the draft bill is designed to clarify and broaden somewhat the power of the Corporation to be of assistance to the railroads of the country. It proposes to add certain new words to section 5 of the Reconstruction Finance Corporation Act so as to permit the Corporation, with the approval of the Interstate Commerce Commission, to purchase for itself, or for account of a railroad obligated thereon, obligations, including equipment trust certificates, of railroads engaged in interstate commerce, in addition to the making of loans to such railroads which the Corporation is at present authorized to make.

Section 4 of the draft bill would authorize the Corporation, in addition, to guarantee the payment of the principal of, and/or interest on, such obligations.

In lieu of the present phrase, "to aid in the temporary financing," the following language has been inserted in section 4: "To aid in the financing, reorganization, consolidation, maintenance, or construction." This language is designed to clarify the position of the Corporation in regard to the assistance which it may give to railroads and railways, and to somewhat enlarge the scope of such assistance.

The first proviso requires the Interstate Commerce Commission, in the case of loans to or the purchase or guarantee of obligations of railroads not in receivership, to certify that such railroad, on the basis of present and prospective earnings, may reasonably be expected to meet its fixed charges without the necessity of a reduction thereof through judicial reorganization. This certificate is not required in the case of loans for the maintenance of, or purchase of equipment for, such railroads, since such loans might be advisable without such a certificate, because they would provide work.

The second proviso at the end of the proposed amendment would require the Corporation to interpret as loans or commitments for loans any guaranties made pursuant to this section, to the extent of the principal amount of the obligations guaranteed.

The reason for including this certification in the Reconstruction Finance Corporation Act is that the requirement for certification of such loans is not included in the Reconstruction Finance Corporation Act, as amended, but is part of the Emergency Railroad Transportation Act of 1933, which provides in part as follows (sec. 15):

"The Commission shall not approve a loan to a carrier under the Reconstruction Finance Corporation Act, as amended, if it is of the opinion that such carrier is in need of financial reorganization in the public interest."

The continuance of such provision seems desirable, but at present it will expire June 16, 1935, unless renewed. The proviso in the draft bill is more specific than the above section 15 in that it deals with fixed charges rather than the vague and uncertain term "in need of financial reorganization." The proviso thus furnishes the Commission with a more definite standard on which to base its approval or disapproval of R.F.C. assistance to railroads.

SECTION 4 (A)

This section of the draft bill would eliminate the proviso contained in section 5 of the Reconstruction Finance Corporation Act, as amended, which authorizes the Corporation to make loans under section 5 to trustees of railroads under section 77 of the Bankruptcy Act. Such proviso is no longer necessary in view of the use of the word "trustee" in section 4 of the draft bill.

Such broad powers would enable the railroads to reduce their fixed charges by providing funds with which the railroads, or the R.F.C. for their account, could buy up outstanding bonds on which the market price is low, so that they would save in interest the difference between the coupon rate of bonds so purchased and used as collateral, and the interest they would pay on the R.F.C. loans. This would also give the R.F.C. and the Interstate Commerce Commission a potent voice in reorganizations plans.

Tie Convention

The Railway Tie Association will hold its seventeenth annual convention at St. Louis, Mo., on May 15-17.

Uniform Scale of Transportation Rates Proposed

Senator Russell, of Georgia, has introduced in the Senate a concurrent resolution declaring that existing rates of transportation have a tendency to deter development in certain sections of the country and expressing the sense of Congress that in the administration of the interstate commerce act it would be to the best interests of the people to have a uniform scale of transportation rates on a mileage basis.

Prohibition of Telegraph Franks and Exclusive Contracts Proposed

The Federal Communications Commission has recommended to Congress amendments to the law under which it operates to prohibit the issuance of telegraph franks, with some exceptions, to prohibit wire or radio companies entering into exclusive contracts with other carriers, and to permit consolidations of telegraph, cable and radio companies subject to conditions. The commission says the present provision of the law for the issuance of franks has been abused and that its operation has resulted in setting up a privileged cast; that the officers and employees of railroads and other carriers who receive franks are not those who are least able to pay for service. It also says that the provision relating to exclusive contracts is desirable whether or not legislation is enacted authorizing the merger of telegraph companies. It showed that railroads have 185 exclusive contracts with the Western Union Telegraph Company, three with the New England Telephone & Telegraph Company, one with the Northern Telegraph Company, and five with the Postal Telegraph Company.

Committee of U. S. C. of C. Urges Crossing Program

Endorses grade separation proposal as relief measure and as work of permanent value

Grade crossing elimination as an unemployment relief measure is strongly endorsed by a committee of the Chamber of Commerce of the United States, reporting to the Chamber's board of directors. Aside from this benefit, the committee commands the work as having a large measure of permanent national value.

"Extensive elimination of railway grade crossings as part of the public works program," says the committee, "will meet pressing needs for reduction of highway hazards, facilitation of traffic and prompt provision of widespread employment.

"There are at present approximately 237,000 rail-highway grade crossings in the United States, of which 4,700 are protected by gates, 6,200 by watchmen and 20,000 by signals. The remainder are protected only by fixed warning signs.

"In addition to the losses due to accidents, there is a continuing cost to highway users from delays experienced at grade crossings, amounting in the aggregate to many millions of dollars annually.

"Under the public works program authorized by Congress in 1933, $400,000,000 was designated for emergency highway construction and this amount was increased by $200,000,000 in 1934. Under this program, which is now 80 per cent completed or contracted for, $22,219,000 has been expended to date or is covered by contracts for the elimination of 483 rail-highway grade crossings.

"Progress in grade separations has in the past been retarded by demands upon the railroads to pay what are now generally recognized to have been excessive shares in the costs of the work.

"Policies have varied in the different states, the railroads having been assigned proportions ranging from 25 to 100 per cent, the most common division having been 50 per cent.

"Under these policies the railroads spent $223,000,000 during the twelve years prior to 1932 and it is estimated that municipal and state governments expended a like amount.

"The unfairness of past policies as to the railroad share in this work has long been recognized and it has been pointed out that the increasing need for this work is due not to the railroads but to the increase in motor traffic on the highways. The general inability of railroads to put money into non-productive improvements at this time is clearly apparent, sound economy in their finances being a matter of special public importance under present conditions.

"It is understood that, on request of the Public Works Administration, the Bureau of Public Roads through the state highway departments has surveyed the grade crossing elimination projects upon which work can be started within 30 to 90 days and is submitting estimates thereof to that Administration.

"This work, for reasons already mentioned, is a logical part of the highway program. To assure its execution on an adequate scale, the necessary funds should be earmarked for it and, as in the case of highway allocations of the past two years, should be entirely from federal sources as allowed by law. No expenditures by the states or communities will be involved.

"Ample funds can, it is believed, be made available through reallocation of funds already available or from unemployment relief appropriations.

"The merits of grade crossing elimination both as an unemployment relief measure and for its permanent value should be recognized and the largest practicable program of such elimination should be promptly put under way."

Public Works Administrator Harold L. Ickes has called upon state and municipal authorities, planning boards, and other public bodies to cooperate in a national inventory of works projects which is being undertaken by the Public Works Administration and the National Resources Board, to obtain before March 1 up-to-date information as to available projects which might be useful in connection with the President's program for work relief and the development of natural resources.

Questionnaires already have been sent to all P.W.A. state engineers who have been instructed to make the survey in conjunction with state planning boards and state planning consultants assigned by the National Resources Board.

The Administrator pointed out that the national inventory does *not* mean that P.W.A. will receive new applications for loans and grants at this time. Completed questionnaires and schedules will *not* be considered applications for funds. Grade crossing separation and railroad terminal facilities are among the types of projects listed in the questionnaires.

Minimum Rates for Buses Dropped

The National Industrial Recovery Board has granted a request of the motor bus code authority for an indefinite stay of the provisions in the motor bus code relating to minimum rates, retroactive to December 31, 1934, on the ground that with the facilities at present available to the board it is not able to determine the accuracy or sufficiency of rates established by the code authority to meet the lowest reasonable cost of operation.

Revision of Lake and Rail Rates Prescribed

The Interstate Commerce Commission on January 22 issued a report and order finding not justified a revision proposed by the railroads of lake-and-rail rates on classes and certain commodities and prescribing in lieu thereof general bases applying between areas A, B, and C, into which the territory east and southeast of Lake Erie is divided, and western areas A, B, and C, west and southwest of Lake Superior and Lake Michigan. Scales of maximum reasonable rates are prescribed over standard lake-rail routes, which are differentials below corresponding all-rail rates, and the class rates are to be subject to the same classification as governs the all-rail rates. The differentials between eastern area A and western areas A and B are to be 30 and 22 cents, respectively; those between eastern area B and points in western areas A and B are to be 25 and 17 cents, respectively; between points in eastern area C and western areas A and B, 20 and 12 cents; and between points in all the eastern territory provided with rates via the Lake Michigan ports under the revised adjustment, and points in western area C, they are to be 12 cents from and to New York and from and to other eastern points differentials reflecting the present relations to the New York differential.

Club Meetings

The Toronto (Ont.) Railway Club will hold its next meeting on Friday evening, February 1, at the Royal York Hotel, Toronto. G. G. Ommanney, development commissioner of the Canadian Pacific, will speak on the railways and development work.

The Northwest Car Men's Association (St. Paul) will hold its next meeting at the Y. M. C. A. Gymnasium, Minnesota Transfer, on Monday evening, February 4. The discussion will be on the new car interchange rules.

Western Railway Club Meeting

Employer-employee relations was the subject of a paper presented by Macy Nicholson, chairman of the National Railroad Adjustment Board, before the meeting of the Western Railway Club at Chicago on January 21. Mr. Nicholson's remarks were concerned primarily with the means provided for the settlement of differences arising between employer and employee and with the importance of such measures of adjustment from the standpoint of general public welfare. An abstract of Mr. Nicholson's paper will appear in the later issue of *Railway Age*.

Transportation Legislation in Congress

The Senate has passed the independent offices appropriation bill, which had passed the House, carrying appropriations for the Interstate Commerce Commission for the fiscal year 1936 amounting to $5,850,656.

Bills introduced in Congress include: S. 1288, by Senator Barkley, of Kentucky, one of the bills proposed by the railroad labor organizations providing for the inspection of signal systems and other appliances; H. R. 4312, by Representative Kee, of West Virginia, the full-crew bill; H. R. 4301, by Representative Cartwright, of Oklahoma, to reduce highway and railway intersection hazards by authorizing an appropriation for emergency construction of public highway and related projects; H. R. 4318 and H. R. 4319, by Representative Rayburn, to restrict the issuance of telegraph franks to railroads and other carriers and prohibit exclusive contracts between railroads and telegraph companies; H. R. 3452, by Representative Nichols, of Oklahoma, to establish an eight-hour day for motor vehicle operators; H. R. 3625, by Representative Boland, of Pennsylvania, to impose federal taxes on buses and trucks. Representative Rayburn has introduced H. R. 4005 and H. R. 4006, recommended by the Interstate Commerce Commission, to amend the interstate commerce act with respect to the time for filing annual reports by the commission and to provide that commissioners whose terms have expired shall "hold over" until their successors have been appointed.

Cultivate Safety Mindedness

The Safety Section of the Association of American Railroads, through its committee on education, has issued circular S433 for the guidance of safety departments in the month of February, giving special attention to that item of the accident record which covers "Struck or Run Over." This familiar heading shows for the year 1933 the total number of employees killed when struck or run over by locomotive or car as 101; and this, indeed, is very much smaller than the records of preceding years of heavier business. But 101 is too large and the circular repeats the various well-known admonitions to "look both ways" when you step on to any track; when alighting from an engine or car; when coming out of a building near the track, etc.

You should think very seriously of this matter, says the circular to employees, because although "you have done much in the past 15 years in improving the record, there is still much to do."

The usual poster is headed—"Man Alive!—look both ways before 'lighting, and keep on living."

Freighthouses Burned

A watchman was killed and damage estimated at $250,000 was sustained when the Wabash outbound freighthouse at Clark and Polk streets, Chicago, was destroyed by fire on January 16. The fire is thought to have been started by the explosion of chemical tanks in transit. Except for the two-story parts of the building at each end, only the west wall of the freight building, 736 ft. long, remained. Before the fire was finally brought under control, it had spread through a string of box cars on the siding east of the freighthouse. All but five of these were saved. Until the freighthouse shall be rebuilt or replaced, the inbound freighthouse at Roosevelt road and Plymouth court will be used for both incoming and outbound shipments.

The old freighthouse of the Georgia Railroad, at Atlanta, Ga., built before the Civil War, was destroyed by fire on January 19, with a loss of about $100,000. It is believed that the cause was an explosion in freight consignments stored in the building. The fire spread to and did damage in the adjacent building of the Atlanta Joint Terminals.

Former T. P. & W. Employees File Suit Against B. of R. T.

Forty-four former employees of the Toledo, Peoria & Western filed suit in the Federal District Court at Cleveland, Ohio, on January 16 against the Brotherhood of Railway Trainmen, seeking $25,000 damages each, or $1,100,000. According to the petition the damages were incurred because the Brotherhood violated the Railway Labor Act in 1929 when the plaintiffs were employees of the railroad. At

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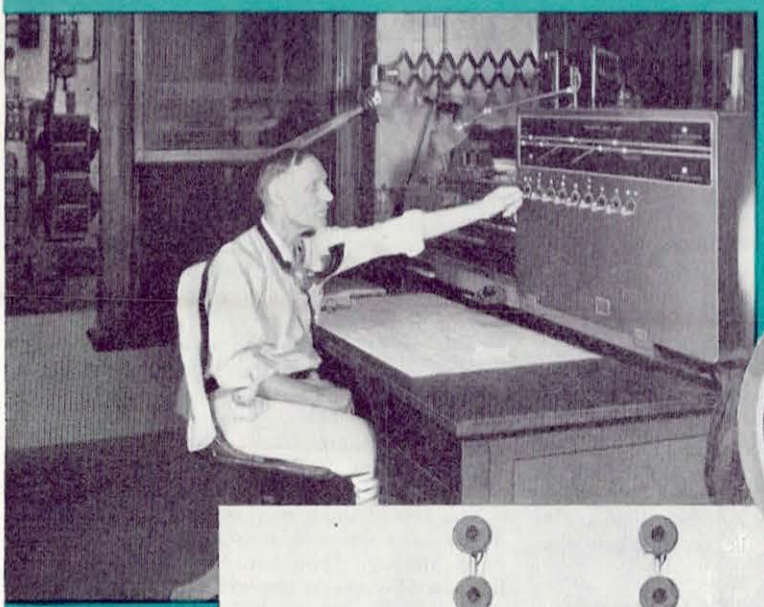
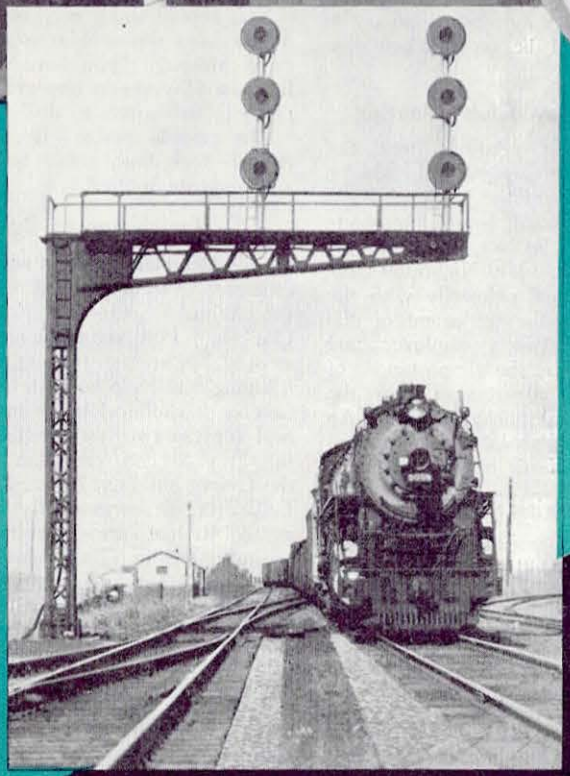




OPERATING STATISTICS

Tons per Freight Train.....
Freight Train Speed.....
G.T.M. per Train Hour.....
Fuel per 1,000 G.T.M.....
Fuel per Pass. Car Mile.....
Freight Loss & Damage
per Revenue Car Loaded.....

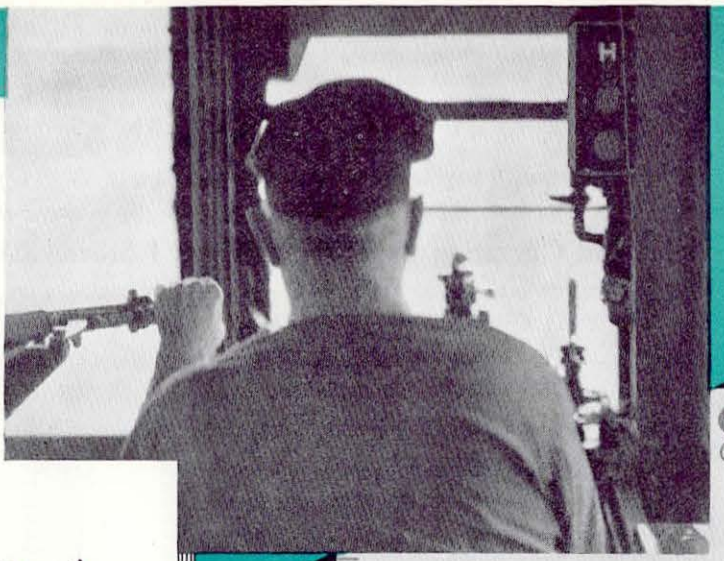
SI

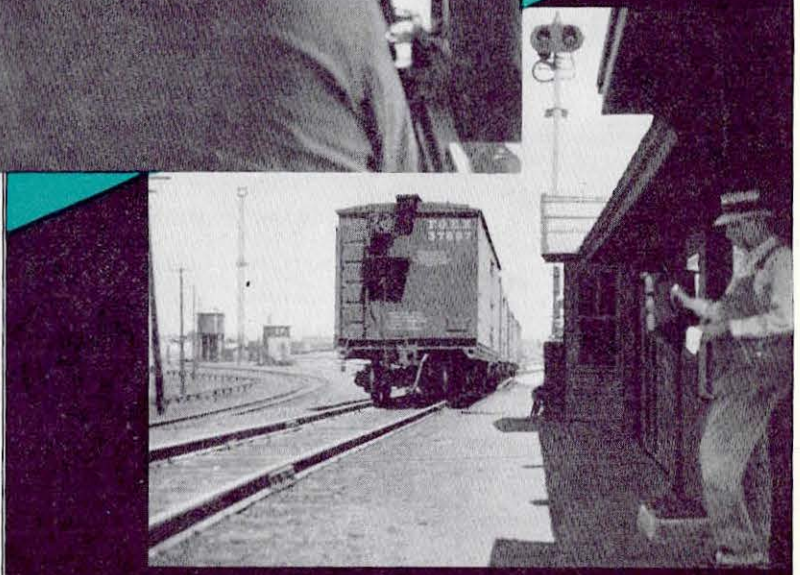
DISTRICT OFFICES

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

Class I Railroads

1922	1933
676	699
11.1 m.p.h.	15.7 m.p.h.
7479	10974
163 lbs.	121 lbs.
17.9 lbs.	15.2 lbs.
$1.11	$0.52





GNALING-

and its Influence on Operating Performance

Operating efficiency has shown marked improvement, especially during recent years, as evidenced by the annual statistics. An analysis of these statistics discloses that this improvement in train performance parallels the increase in road miles signaled; that the roads showing the greatest reduction in cost per ton mile and the greatest increase in train load and speed, are among those well signaled. » » » » » »

Continuance of the improvement in operating efficiency may be expected from increased signal mileage and greater use of centralized traffic control, remotely controlled switch machines, cab signals and car retarders. » » » » » »

Our representatives will be glad to cooperate in connection with any proposed signal improvement work. » » » »

1881 **Union Switch & Signal Co.** 1935

SWISSVALE, PA.

that time a committee was appointed by the Peoria branch of the Brotherhood to negotiate with the railroad for a wage increase and before an agreement had been made two representatives of the Brotherhood were dispatched to Peoria with instructions to take charge of negotiations. In November, 1929, according to the petition, the two representatives asked for a strike vote with which to deal more effectively with the railroad promising that a strike would not be called. The strike was called on November 13 and the Railway Labor Act was violated, the petition charges, in that the Brotherhood representatives called the strike without first appealing to authorities in Washington. The strike continued for some time, the petition says, and at its conclusion the defendants were not reinstated by the railroad and thus lost their seniority rights.

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled From 147 Monthly Reports of Revenues and Expenses Representing 149 Class I Steam Railways

FOR THE MONTH OF NOVEMBER, 1934 AND 1933

Item	United States 1934	United States 1933	Eastern District 1934	Eastern District 1933	Southern District 1934	Southern District 1933	Western District 1934	Western District 1933
Average number of miles operated	238,827	240,237	59,191	59,395	45,337	45,592	134,299	135,250
Revenues:								
Freight	$208,546,651	$209,922,141	$86,930,536	$88,298,812	$43,337,057	$40,903,201	$78,279,058	$80,720,128
Passenger	24,845,540	24,972,238	14,825,683	15,200,869	3,248,867	3,060,963	6,770,990	6,710,406
Mail	7,581,775	7,669,427	2,911,485	2,975,962	1,356,843	1,334,176	3,313,447	3,359,289
Express	4,404,979	4,128,034	1,691,329	1,856,352	847,523	735,409	1,866,127	1,536,273
All other transportation	6,129,041	5,740,164	3,049,197	3,078,315	658,568	511,009	2,421,276	2,150,840
Incidental	4,860,339	4,659,125	2,718,975	2,641,541	739,741	691,590	1,401,623	1,325,994
Joint facility—Cr.	763,751	789,223	245,460	238,533	171,888	180,102	346,403	370,588
Joint facility—Dr.	164,895	194,405	48,261	41,139	9,729	19,776	106,905	133,490
Railway operating revenues	256,967,181	257,685,947	112,324,404	114,249,245	50,350,758	47,396,674	94,292,019	96,040,028
Expenses:								
Maintenance of way and structures	27,873,818	26,075,644	10,743,232	10,644,522	5,745,279	5,006,890	11,385,307	10,424,232
Maintenance of equipment*	50,445,340	52,748,349	21,943,424	23,914,067	10,084,806	9,896,835	18,417,110	18,937,447
Traffic	7,372,659	7,205,034	2,772,572	2,738,395	1,446,108	1,323,996	3,153,979	3,142,643
Transportation	95,596,106	92,234,887	43,529,780	42,744,414	16,182,420	15,403,909	35,883,906	34,086,564
Miscellaneous operations	2,145,398	1,919,969	1,029,438	960,071	243,479	202,477	872,481	757,421
General	a 14,740,602	b 11,881,204	6,410,167	5,181,179	2,463,502	2,006,452	5,866,933	4,693,573
Transportation for investment—Cr.	302,041	223,123	80,124	84,928	37,764	22,898	184,153	115,297
Railway operating expenses	197,871,882	191,841,964	86,348,489	86,097,720	36,127,830	33,817,661	75,395,563	71,926,583
Net revenue from railway operations	59,095,299	65,843,983	25,975,915	28,151,525	14,222,928	13,579,013	18,896,456	24,113,445
Railway tax accruals	17,259,926	17,477,722	7,533,665	7,058,733	3,441,351	3,136,650	6,284,910	7,282,339
Uncollectible railway revenues	70,098	158,305	29,539	104,288	10,302	13,710	30,257	40,307
Railway operating income	41,765,275	48,207,956	18,412,711	20,988,504	10,771,275	10,428,653	12,581,289	16,790,799
Equipment rents—Dr. balance	7,186,680	7,421,392	3,491,594	3,905,264	272,974	218,262	3,422,112	3,297,866
Joint facility rent—Dr. balance	2,995,891	3,124,442	1,679,226	1,723,184	360,817	318,813	955,848	1,082,445
Net railway operating income	31,582,704	37,662,122	13,241,891	15,360,056	10,137,484	9,891,578	8,203,329	12,410,488
Ratio of expenses to revenues (per cent)	77.00	74.45	76.87	75.36	71.75	71.35	79.96	74.89
* Includes:								
Depreciation	14,992,212	15,047,019	6,612,291	6,107,569	2,910,996	2,952,824	5,468,925	5,985,626
Retirements	145,080	1,571,440	d 57,078	838,623	143,618	163,359	59,440	569,458

FOR ELEVEN MONTHS ENDED WITH NOVEMBER, 1934 AND 1933

Item	United States 1934	United States 1933	Eastern District 1934	Eastern District 1933	Southern District 1934	Southern District 1933	Western District 1934	Western District 1933
Average number of miles operated	239,172	240,915	59,193	59,519	45,434	45,754	134,545	135,642
Revenues:								
Freight	$2,434,030,541	$2,301,225,209	$1,033,310,950	$980,288,614	$480,053,661	$463,950,254	$920,665,930	$856,986,341
Passenger	c 314,204,096	c 300,030,236	187,992,817	179,446,400	40,271,117	35,180,323	85,940,162	85,403,513
Mail	81,803,071	82,489,785	31,682,412	32,345,025	14,392,815	14,201,557	35,727,844	35,943,203
Express	49,167,579	41,416,981	20,508,226	18,326,567	9,634,788	7,800,225	19,024,565	15,290,189
All other transportation	69,161,077	66,216,819	35,492,229	36,573,876	6,589,874	5,890,645	27,078,974	23,752,298
Incidental	59,183,782	53,275,933	31,584,310	29,516,127	8,572,563	7,580,122	19,026,909	16,179,684
Joint facility—Cr.	8,453,842	7,694,258	2,642,504	2,489,477	1,939,373	1,690,155	3,871,965	3,514,626
Joint facility—Dr.	2,063,273	2,075,449	545,640	572,262	181,619	209,862	1,336,014	1,293,325
Railway operating revenues	3,013,940,715	2,850,273,772	1,342,667,808	1,278,413,824	561,272,572	536,083,419	1,110,000,335	1,035,776,529
Expenses:								
Maintenance of way and structures	339,950,812	299,352,317	134,620,567	120,047,129	65,701,202	58,844,254	139,629,043	120,460,934
Maintenance of equipment†	589,282,239	548,293,629	263,094,067	247,145,693	111,947,562	103,859,493	214,240,610	197,288,443
Traffic	81,776,629	78,538,362	31,010,546	29,374,661	15,585,870	14,844,106	35,180,213	34,319,595
Transportation	1,065,763,940	985,714,247	496,051,040	457,893,131	177,737,959	165,446,361	391,974,941	362,374,755
Miscellaneous operations	24,599,210	21,365,993	11,891,113	10,745,166	2,852,731	2,414,487	9,855,366	8,206,340
General	f 147,840,464	g 131,683,084	63,819,247	56,868,029	24,601,616	22,437,223	59,419,601	52,377,832
Transportation for investment—Cr.	2,792,226	2,510,438	805,670	883,586	294,715	291,861	1,691,841	1,334,991
Railway operating expenses	2,246,421,068	2,062,437,194	999,680,910	921,190,223	398,132,225	367,554,063	848,607,933	773,692,908
Net revenue from railway operations	767,519,647	787,836,578	342,986,898	357,223,601	163,140,347	168,529,356	261,392,402	262,083,621
Railway tax accruals	226,649,708	238,371,805	95,898,222	98,944,947	44,484,718	45,139,252	86,266,768	94,287,696
Uncollectible railway revenues	1,006,713	1,052,622	513,457	473,996	160,296	126,083	332,960	452,543
Railway operating income	539,863,226	548,412,061	246,575,219	257,804,658	118,495,333	123,264,021	174,792,674	167,343,382
Equipment rents—Dr. balance	83,358,170	78,349,001	40,613,323	40,461,653	5,386,151	3,978,915	37,358,696	33,908,433
Joint facility rent—Dr. balance	33,387,528	33,577,097	18,505,829	18,234,165	4,071,830	3,674,883	10,809,869	11,668,049
Net railway operating income	423,117,528	436,485,963	187,456,067	199,108,840	109,037,352	115,610,223	126,624,109	121,766,900
Ratio of expenses to revenues (per cent)	74.53	72.36	74.45	72.06	70.93	68.56	76.45	74.70
† Includes:								
Depreciation	169,388,858	165,989,626	74,914,345	66,200,124	31,877,498	32,964,433	62,597,015	66,825,069
Retirements	4,158,866	13,343,584	616,622	9,859,219	1,947,218	1,096,664	1,595,026	2,387,701

a Includes accruals on account of pensions, as follows: Under Federal Retirement Act, $2,706,778; under previously existing plan, $2,937,084, but excludes pension accruals held in suspense and not charged to operating expenses.

b Includes accruals on account of pensions, under previously existing plan, $2,872,819.

c Includes accruals on account of pensions, as follows: Under Federal Retirement Act, $13,098,115; under previously existing plan, $32,300,699, but excludes pension accruals held in suspense and not charged to operating expenses.

d Deficit or other reverse items.

e Includes accruals on account of pensions, under previously existing plan, $30,717,612.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to Revision

Milwaukee Trains Again Speeded Up

The Chicago, Milwaukee, St. Paul & Pacific, now runs two trains between Chicago and Milwaukee, Wis., on schedules of 80 min. for the 85 miles, this being the third time that schedules between these two cities have been speeded up during the last year. Last summer, the shortest schedule was 90 min., while on January 3, five Milwaukee trains, a morning and afternoon train from Chicago and three morning trains from Milwaukee, were scheduled at 85-min. The new schedules average 64.59 miles an hour southbound. This is the highest speed between metropolitan centers in America.

To further popularize travel between the two cities, the Milwaukee and the Chicago & North Western will introduce, on February 1, commuters' tickets good for 10 rides between Chicago and Milwaukee at a reduction of about 38 per cent as compared with one-way first-class tickets between these points.

Snow Blocks Service in Cascades

Railroad operation through the Cascades was temporarily abandoned on January 19-21 when a heavy rain and snowfall caused the snow on the west slope to move and block the tracks. On January 23 the "Empire Builder" of the Great Northern, which was to arrive at Chicago that morning, was 26 hours late. The "North Coast Limited" of the Northern Pacific, which left Seattle, Wash., on January 19, was annulled at Spokane and a makeup train was dispatched from that point on January 21. On January 23 this train was running 26 hours late. The January 19 and 20 sections of the "Olympian" of the Chicago, Milwaukee, St. Paul & Pacific out of Seattle were also annulled. A makeup train left Seattle at 11 a. m. on January 23 and was expected to arrive in Chicago on the evening of January 25.

A.R.E.A. Nominates Officers

The following members of the American Railway Engineering Association have been nominated as officers for the year beginning at the close of the next annual convention on March 14: President, Robert H. Ford, assistant chief engineer, C. R. I. & P.; second-vice-president, J. C. Irwin, valuation engineer, Boston & Albany; secretary, E. H. Fritch; treasurer, A. F. Blaess, chief engineer, I. C.

Directors (three to be elected): C. B. Stanton, professor of civil engineering, Carnegie Institute of Technology; W. T. Dorrance, assistant to chief engineer, N. Y., N. H. & H.; D. J. Kerr, assistant to vice-president, G. N.; W. C. Barrett, operating department, L. V.; Bernard Blum, chief engineer, N. P.; F. R. Layng, chief engineer, B. & L. E.; Meyer Hirschthal, concrete engineer, D. L. & W.; W. H. Penfield, engineer maintenance of way, C. M. St. P. & P.; Ralph Budd, president, C. B. & Q.

Members of Nominating Committee (five to be elected): M. M. Backus, assistant engineer maintenance of way, I. C.; E. G. Hewson, engineer maintenance of way, C. N.; J. G. Brennan, engineer of grade crossings, N. Y. C.; M. J. J. Harrison, general scale inspector, Penna.; C. J. Geyer, engineer maintenance of way, C. & O.; Robert Faries, assistant chief engineer-maintenance, Penna.; F. S. Hewes, office engineer, A. T. & S. F.; F. S. Schwinn, assistant chief engineer, M. P.; H. Austill, bridge engineer, M. & O.; J. S. Lillie, property and tax commissioner, G. T. W.

In addition to the above, A. R. Wilson, second vice-president of the association, automatically becomes first vice-president.

Railroads Included in Unemployment Insurance Bill

Railroads subject to the railroad retirement act, including any amendments hereafter made to that act, are exempted from the provisions of the Administration's social security bill, introduced in the Senate on January 17 by Senator Wagner, so far as the provisions relating to old-age pensions are concerned, but they are not excepted by the terms of the bill from that part of it relating to the imposition of a payroll tax on employers for the purpose of unemployment benefits. It is understood, however, that such an exemption may be inserted later if Congress acts on the recommendations proposed by Co-ordinator Eastman for establishing a system of dismissal wages for railroad employees.

The President's Committee on Economic Security, on whose report the plan is based, said in its report that it was opposed to exclusions of any specified industries from the federal act but favored the establishment of a separate nationally administered system of unemployment compensation for railroad employees and maritime workers and it also recommended an exception of the railroads that are under the retirement act from the provisions of the compulsory annuity system.

The proposed payroll tax upon employers for the purpose of establishing unemployment compensation funds is to be from 1 to 3 per cent for each year beginning with 1936, depending upon the Federal Reserve Board's adjusted index of total industrial production averages.

Operation of the railroad retirement act has been suspended because of the decision of the supreme court of the District of Columbia that certain of its provisions are unconstitutional but the case has been appealed to the Supreme Court of the United States. After its decision Mr. Eastman is expected to submit recommendations for such amendments to the law as may be necessary to comply with its findings.

Air Express Business in 1934

Air express handled by the Railway Express Agency registered a gain in number of shipments of 102 per cent for 1934 over the previous year. Heavy gains were reported from all sections of the system comprising the routes of 14 commercial airline operators, and a tonnage increase of 115 per cent was made over figures for 1933. Revenue for this traffic, despite heavy rate reductions on August 15, showed 90 per cent gain for the year.

Although the average charge for air express packages handled during 1934 was $2.98, the present minimum charges of 85 cents for ¾ lb. and $1 for one lb. between any two points on the Railway Express Agency air system which included more than 120 airport cities, accounted for a large percentage of the shipment increase and caused the number of air shipments handled during December to exceed any previous month. The average length of haul reported for the year was 1,100 mi., approximately unchanged from the previous year. C. O. D. shipments were handled in increasing numbers and a high percentage of air shipments were carried in the Agency's air-rail service.

Commodities handled ranged from feathers to lead pipe and from denim to diamonds, with motion picture film, newsphotos, advertising material, clothing, reports, and radio transcription records comprising the heaviest steady traffic. Cut flowers, merchandise samples, machine repair parts, automobile equipment, printed matter, electrical goods, foodstuffs, medicines and surgical instruments also largely contributed to the increase for the year, it was stated.

During the year the air express service of Railway Express was made more convenient to shippers by arrangements with Western Union Telegraph Company providing for telegraph messenger pick-up and acceptance of packages at offices where messengers are employed. Contract agreements were consummated with Pan American Airways on August 1, co-ordinating the air and rail express service within the United States with the airline system circling the southern Americas and thus speeding express service to and from Latin-America. This latter service has recently been extended to Venezuelan points following completion of arrangements with the Venezuelan government for handling of traffic through customs. Although Pan American has maintained passenger and mail service to Venezuela since inauguration of the international airline, express service, including collect and C. O. D. facilities, has been established only after negotiations tending toward elimination of customs difficulties.

P. & S. Division Organizes Committee Work

The Purchases and Stores Division, Association of American Railroads, has completed the formation of the committees assigned to study and report on the several subjects which will be of particular interest to the division during the year and has prepared a revised list of the personnel of each committee. The personnel of the general and advisory committees and the chairmen of the other committees are listed below:

General Committee: (Elective) Chairman, G. E. Scott, purchasing agent, M.-K.-T.; vice-chairman, C. B. Tobey, general storekeeper, L. V.; F. S. Austin, purchasing agent, B. & A.; J. L. Bennett, purchasing agent, C. of Ga.; E. A. Clifford, general purchasing agent, C. & N. W.; J. U. King, general storekeeper, A. C. L.; J. C. Kirk, assistant general storekeeper, C. R. I. & P.; L. P. Krampf, supply agent, M. P.; H. P. McQuilkin, assistant purchasing agent, B. & O.; A. C. Mann, vice-president, I. C.; H. M. Smith, general storekeeper, N. P.; A. L. Sorensen, manager of stores, Erie; L. C. Thomson, manager of stores, C. N. R.; G. H. Walder, purchasing agent, C. M. St. P. & P.; C. E. Walsh, general purchasing agent, Penna.; L. B. Wood, general storekeeper, S. P. (Tex. & La.); W. J. Farrell, secretary.

Advisory Committee: (Past-Chairmen of the

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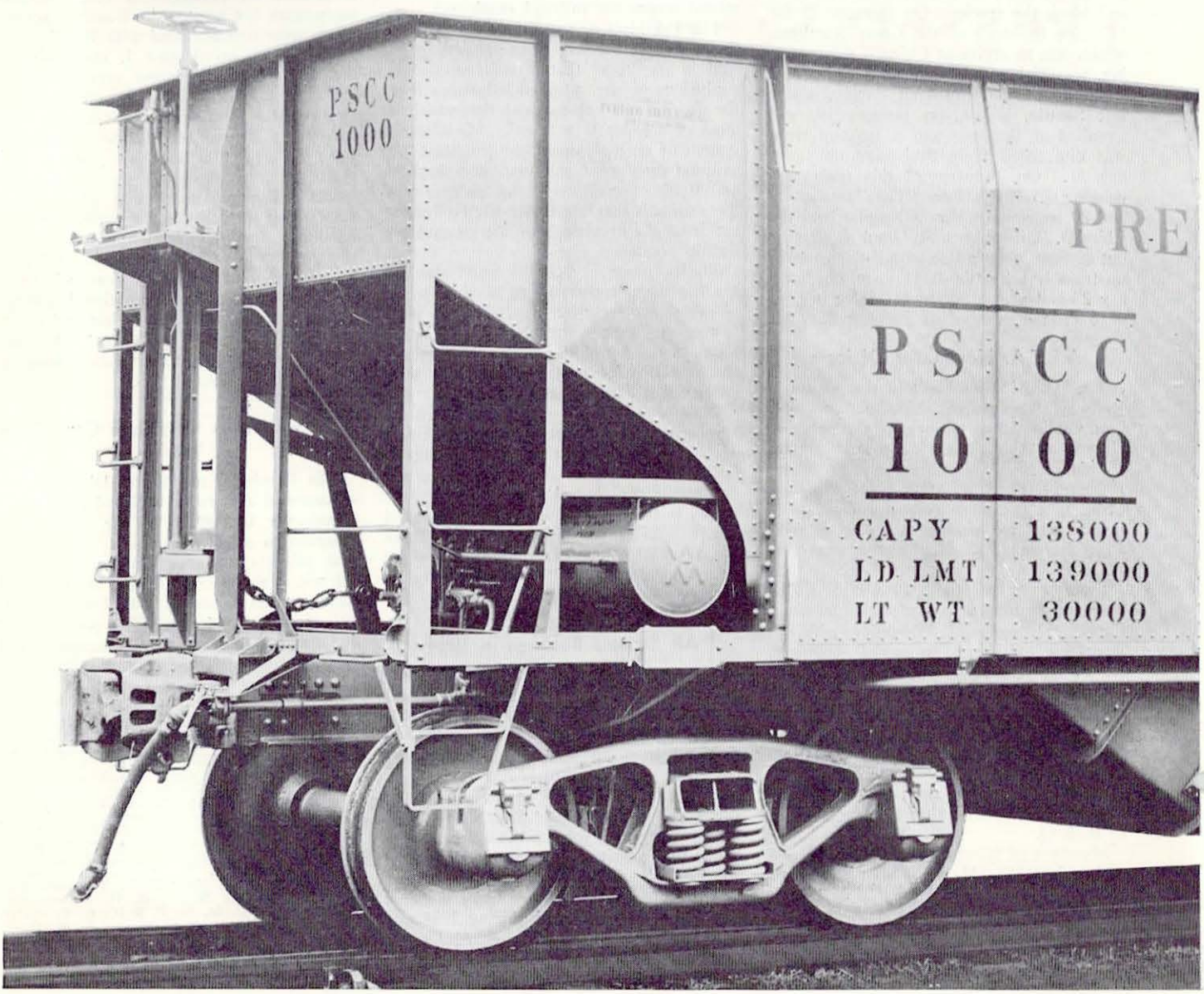
8% Increase in Pay-Load Ratio



The Outstanding Improvement
IN FREIGHT CAR DESIGN . .

IN 1934 — you've seen the public react with dramatic enthusiasm to new and striking advances in railway passenger equipment.

But — as the outstanding contribution to railway progress — how do you evaluate a 40 per cent reduction in the weight of freight equipment — *an increase of 8 per cent in pay-load ratio?*

The Pressed Steel Car Company's light weight Hopper Car — designed to fully utilize the marvelous properties of U. S. S. Cor-Ten Steel — provides a payload ratio of 4.63 to 1 — it weighs 15 tons — carries 69½ tons — and has corrosion resistant qualities three times greater than that of a car made of ordinary steel.

Consider, what decreased dead weight means to one class of equipment alone. The 600,000 steel coal cars now on the railways weigh about 13,000,000 tons — a reduction of 40 per cent in weight would mean 5,200,000 less tons of metal to be hauled around the country! This light weight car permits more revenue tons per train which would result in tremendous all around savings due to less gross ton-miles—less car miles—less train miles.

Here is really the outstanding railway development—A Better Car for Better Earnings.

PRESSED STEEL CAR COMPANY
PITTSBURGH, PENNSYLVANIA

Division) D. C. Curtis, chief purchasing officer, C. M. St. P. & P.; U. K. Hall, general purchasing agent, U. P.; C. C. Kyle, purchasing agent, N. P.; A. S. McKelligon, general storekeeper, S. P.; A. W. Munster, vice-president, B. & M.; H. C. Pearce, assistant to vice-president, C. G. W.; H. E. Ray, general storekeeper, A. T. & S. F.; F. D. Reed, purchasing agent, C. R. I. & P.; L. C. Thomson, manager of stores, C. N. R.; C. E. Walsh, general purchasing agent, Penna.; C. D. Young, vice-president, Penna.

Subject 1—Purchasing and Stores Department Manual—Recommended Rules and Practices: H. R. Toohey, chairman, inspector of stores, C. M. St. P. & P.

Subject 2—Standard Material Classification: F. J. McMahon, chairman, general storekeeper, N. Y. C.

Subject 3—Classification, Handling and Sale of Scrap: James Young, chairman, assistant purchasing agent. Pennsylvania.

Subject 3A—General Reclamation: I. C. Bon, chairman, superintendent of reclamation, Wabash.

Subject 4—Comparisons of Material Stock Reports and Material Store Expenses: C. E. Smith, chairman, vice-president, N. Y. N. H. & H.

Subject 4A—Joint Committee on Material Store Expenses: J. F. Riddle, chairman, statistician, Pennsylvania.

Subject 5—Forest Products: C. C. Warne, purchasing agent, N. Y. C.

Subject 6—Purchasing and Storekeeping for Highway Motor Vehicles: E. S. Montgomery, chairman, assistant to purchasing agent, N. Y. N. H. & H.

Subject 9—Fuel: J. M. Johnston, chairman, fuel agent, M.-K.-T.

Subject 10—Control of Purchased and Shop-Manufactured Stocks and Co-ordinating Procurement with Actual Needs: M. E. Towner, chairman, general purchasing agent, W. Md.

Subject 11—Pricing and Inventory: W. S. Morehead, chairman, general storekeeper, I. C.

Subject 12—Purchasing Agents' Organization, Practices and Office Records: H. M. Rainie, chairman, purchasing agent, B. & M.

Subject 13—Stationery and Printing: O. B. Mills, chairman, stationery storekeeper, Pennsylvania.

Subject 14—Stores Department Fire Prevention: B. T. Adams, chairman, district storekeeper, I. C.

Subject 16—Simplification and Standardization of Stores Stocks: A. G. Follette, chairman, general material supervisor, Pennsylvania.

Subject 17—Stores Department Safety Practices: C. L. Wakeman, chairman, general storekeeper, Wabash.

Subject 18—Terminal Railway Storekeeping: C. W. Yeamans, chairman, purchasing and supply agent, C. & W. I.

Subject 19—Capacity Loading and Prompt Handling of Company Material Cars: F. I. Foley, chairman, general storekeeper, N. Y. N. H. & H.

Subject 21—Purchasing, Storage and Distribution of Equipment and Supplies Used in Dining Cars, Hotels and Commissaries: H. N. Mellor, chairman, commissary agent, Pennsylvania.

Subject 27—New Ideas and Economies: C. K. Reasor, chairman, assistant manager stores, Erie.

Subject 28—Purchase of Special Devices and Commodity Purchases: P. L. Grammer, chairman, assistant purchasing agent, Pennsylvania.

Subject 29—Exchange of Surplus Material: W. S. Galloway, chairman, purchasing agent, B. & O.

Subject 31—Material Guarantees—General Practice as to Guarantees—Failures, Methods of Handling: C. D. Baldwin, chairman, purchasing agent, Bangor & Aroostook.

Subject 32—Adoption of Recommended Practices: P. L. Grammer, chairman, assistant purchasing agent, Pennsylvania.

Subject 33—Stores Department Buildings and Facilities for Economical Handling of Materials: S. A. Hayden, chairman, general storekeeper, M.-K.-T.

Committee on Subjects: C. E. Walsh, chairman, general puchasing agent, Pennsylvania.

Committee on Annual Contest: J. C. Kirk, chairman, assistant general storekeeper, C. R. I. & P.

Committee on Committees: A. L. Sorensen, chairman, manager of stores, Erie.

Nominating Committee: (Elective) C. E. Walsh, chairman, general purchasing agent, Pennsylvania.

Joint Committee on Inspection of Materials: A. C. Mann, chairman, vice-president, I. C.

Purchasing Group Advisory Committee: F. D. Reed, chairman, purchasing agent, C. R. I. & P.

Zero Hour for Railroads as Private Enterprise

(Continued from page 176)

late them but do not regulate their competitors, and which subsidize all their competitors, but do not subsidize them. This means that regulation of all transportation agencies shall be made equal, either by reducing that applied to the railways or by increasing that applied to other carriers. It means that such tolls or rentals should be imposed for the commercial use of waterways and highways that the taxpayers of the country will be reimbursed for providing and maintaining them for commercial use. It means that government policies should no longer be followed which make labor costs for the same kind and hours of work much higher for the railways than for carriers competing with them.

"No industry or spokesman of industry can oppose this general policy without standing convicted of opposing for transportation the same square deal that every industry professes to want for itself. Nevertheless, there are business interests and their spokesmen that hypocritically and dishonestly pretend to be opposed to government in business in general and to government ownership of railways in particular, but that, at the same time, are promoting government ownership of railways by opposing every effort to establish fair competition within the transportation industry.

"When business interests thus expose themselves to just charges of selfish disregard of every sound principle of governmental and economic policy, it is not surprising that labor leaders should, with equal selfishness, in the ostensible interest of their union members, advocate policies which equally defy every sound principle of public policy, economics and horse sense. The leaders of the railway labor unions at their recent meeting in Chicago announced that they would demand of Congress legislation to (1) increase the average hourly wage of railway employees 33 per cent by the establishment of a six-hour day at eight hours' pay, (2) add one or more unneeded employees to most trains, (3) arbitrarily limit freight trains to a length of a half mile or 70 cars and passenger trains to 14 cars. The railways during the three years ending with 1934 earned an annual average of only $421,000,000 in excess of their operating expenses and taxes. Other things being equal, the legislation for which the labor leaders ask would have made operating expenses last year $600,000,000 larger than they were. This means that, on the basis of the last three years' experience, annual operating expenses and taxes would exceed total earnings by almost $200,000,000 annually. There would be that much less than nothing at all with which to pay even interest on bonds.

"Where do the labor leaders expect the railways to get the money to pay such an increase in operating expenses? Even now representatives of many industries are appearing before the Interstate Commerce Commission in opposition to a proposed advance of $170,000,000 annually in freight rates to enable the railways partly to meet increased NRA prices and advances in wages being made to restore them on April 1 to the highest level in all history. Why have the labor leaders presented their demands to Congress instead of submitting them to the railways under the Railway Labor Act, a measure passed by Congress 10 years ago at the joint request of labor leaders and railway executives to afford a means of settling wages and working conditions by mediation, arbitration or by a commission appointed by the President of the United States? Obviously, they have presented their demands direct to Congress because they believe their best chance to get them complied with is by political lobbying accompanied by threats of strikes.

"The restoration of railway wages to the pre-depression level on April 1 will be entirely unwarranted under the existing railroad and economic conditions, and demands now being made by the labor leaders for enormously expensive legislation demonstrate that they are willing, for their own purposes, absolutely to ruin the railroad industry and drive it into government ownership, under which the enormous deficit compliance with their demands would cause would become a charge upon the taxpayers of the United States.

"The time has come to fight the railroad question out to a finish on two fronts—to fight it out with both the business interests and the labor leaders that, for the most selfish purposes, are seeking to ruin the railroad industry. It should be fought out on every rostrum and before every legislative body in the country. It should be fought out by the railways making the most determined effort to establish wages and working conditions justifiable under present economic conditions. With 700,000 railway men out of work, and more transportation by other carriers available now than ever before, a strike on the railways at present would be more dangerous to the labor union leaders and the strikers, and less dangerous to the railways themselves and to the public, than under almost any other conceivable conditions. The challenge to the railways and the public made by the labor union leaders in their enormous and indefensible demands should, therefore, be squarely met by railway security owners, railway managers and the public.

"The public is the great party in interest. In much larger measure than the private capital invested in railroads, it must pay the bill for subsidies and unequal regulation in transportation, for present already excessively costly railway wages and working conditions and for any yielding by Congress to the new demands of labor leaders for legislation to make railway employees a class favored far above all other classes of the people at a cost that would not only destroy private ownership but undermine our entire economic structure. Not only is the public the great party in interest, but it will mainly determine the fortunes of battle. The great issues involved should, therefore, be fought out right now, and the public be given full opportunity to decide, first, whether it wants the railroads ruined or not; second, whether it wants government ownership or not; and third, whether it will have policies that will make the total cost of transportation unbearable to all who pay rates and taxes, or policies that will make the total cost of transportation reasonable and cause it all to be paid in rates by those to whom the service is rendered, and not, as now, largely and increasingly in taxes."

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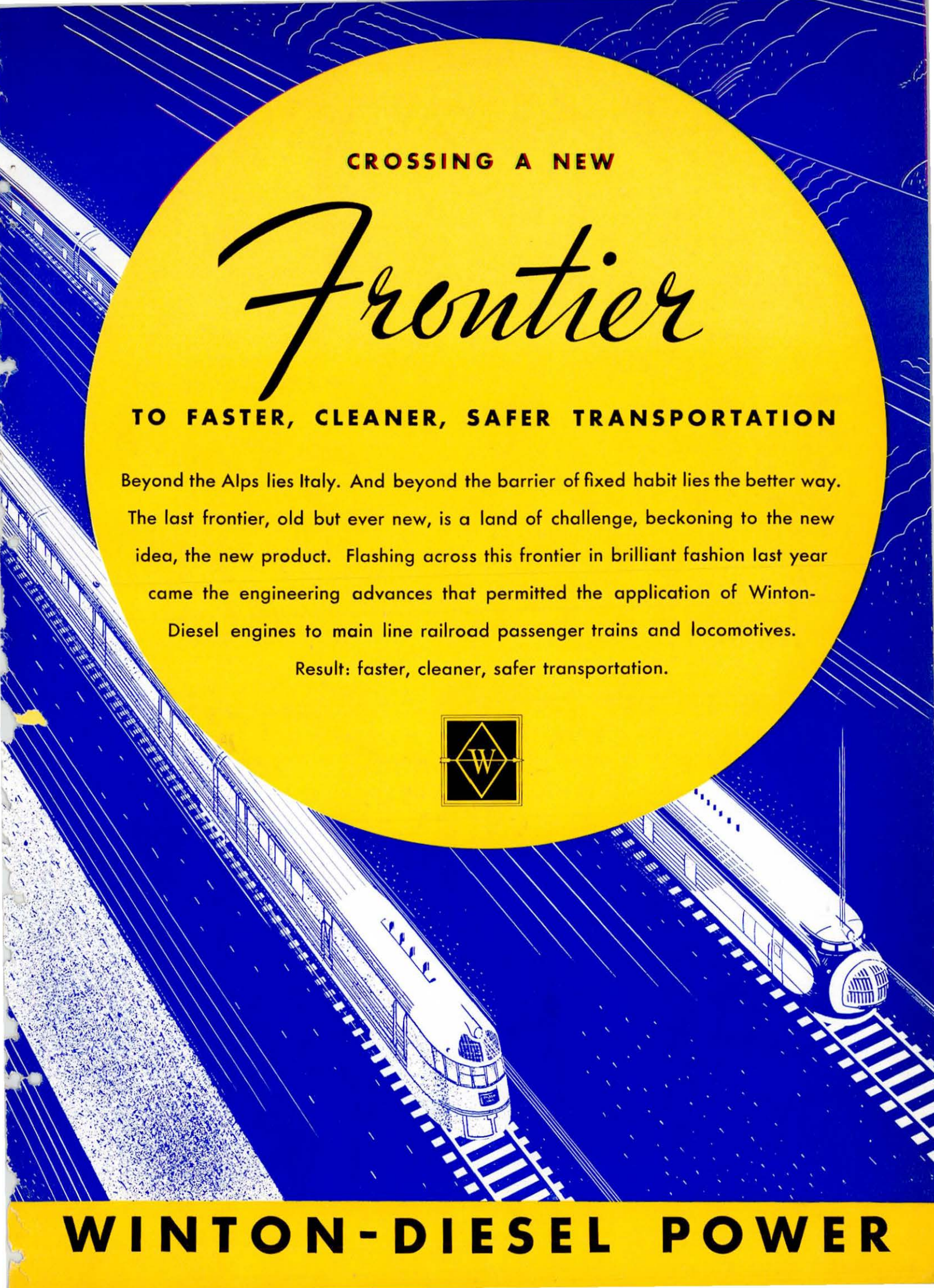


CROSSING A NEW

Frontier

TO FASTER, CLEANER, SAFER TRANSPORTATION

Beyond the Alps lies Italy. And beyond the barrier of fixed habit lies the better way. The last frontier, old but ever new, is a land of challenge, beckoning to the new idea, the new product. Flashing across this frontier in brilliant fashion last year came the engineering advances that permitted the application of Winton-Diesel engines to main line railroad passenger trains and locomotives. Result: faster, cleaner, safer transportation.

WINTON-DIESEL POWER

DIESEL - ELECTRIC

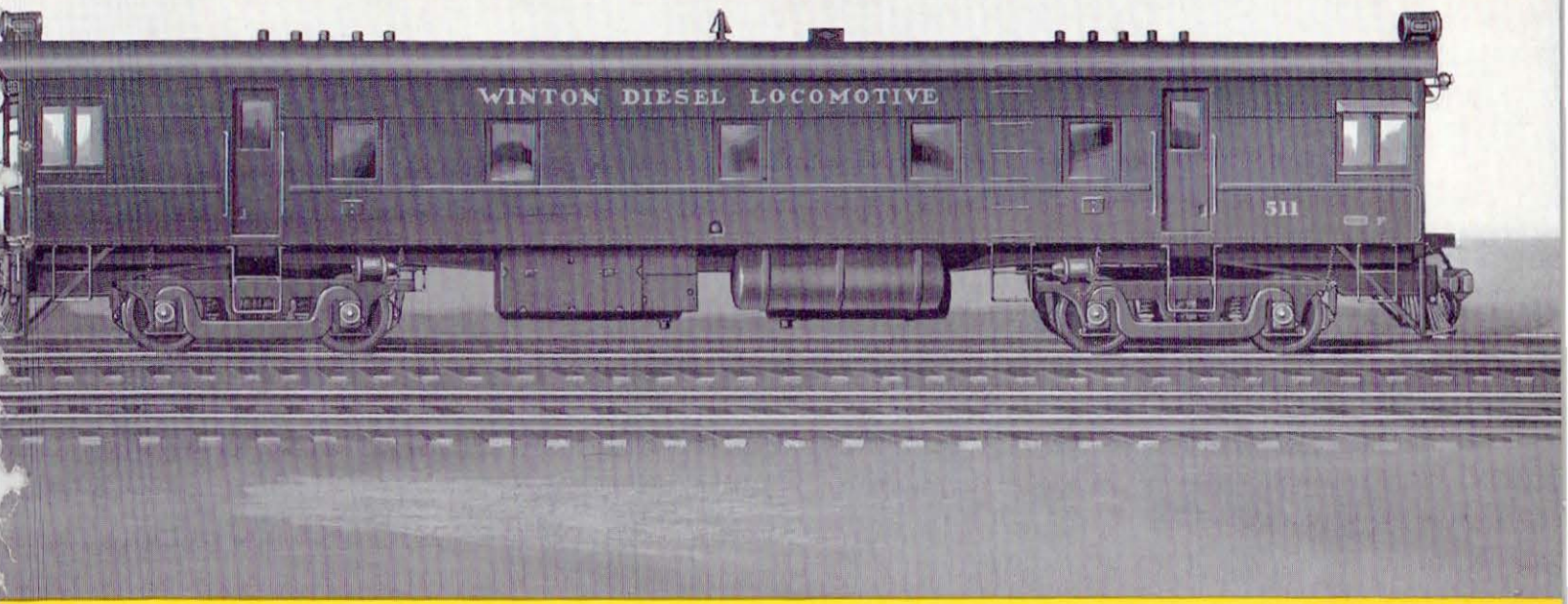
MAXIMUM SPEED - 100 MILES PER HOUR

WEIGHT ON DRIVERS - 440,000 POUNDS

TRACTIVE EFFORT

STARTING - - - - -	110,000 POUNDS
10 MILES PER HOUR - - -	89,000 POUNDS
30 MILES PER HOUR - - -	37,000 POUNDS
60 MILES PER HOUR - - -	19,000 POUNDS

Symbol of Economy and Dependability



ROAD LOCOMOTIVE

WEIGHT OF CARS = 80 TONS EACH

BALANCED SPEEDS = MILES PER HOUR

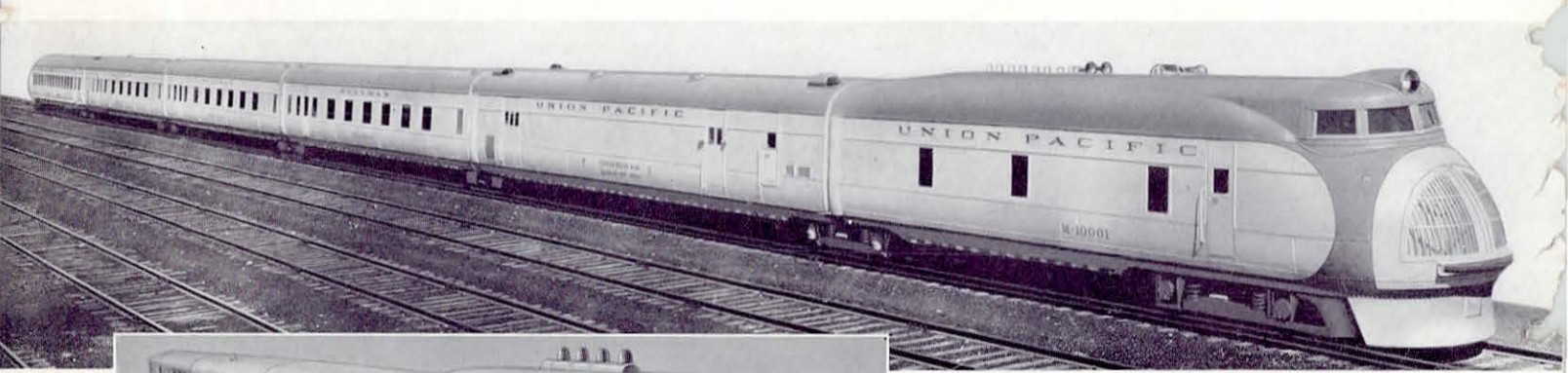
GRADE	10 CARS	12 CARS	14 CARS	16 CARS
LEVEL	87.50	84.00	81.00	78.00
.2%	78.75	72.70	68.00	63.00
.6%	57.25	51.90	47.10	42.60
1.0%	43.50	38.30	34.25	30.80

THIS NEW UNIT, NOW BEING DEVELOPED, WILL BE READY FOR SERVICE THE LATTER PART OF FEBRUARY, WHEN IT WILL BE OFFERED TO THE RAILROADS FOR DEMONSTRATING PURPOSES

HIGH-SPEED *Streamlined*

PASSENGER TRAINS POWERED by WINTON

PROUDLY taking first place in the persistent quest for faster, cleaner, safer transportation, the new streamlined trains powered with Winton-Diesel engines epitomize a dramatic transition in passenger travel. In railroad development the demand for speed has always been present. To this, modern competition has added another vital need, economy. Modern Winton-Diesel power has proved to be the answer to both of these demands. To the traveling public this new high-speed equipment means a decided saving in time, greater comfort, safety, and cleanliness. To the railroad executive it means economy in operating costs and continuity of service. Figures compiled for one month's scheduled service of the Burlington Zephyr show its operating cost to be only 25% of the total revenue derived from its service. So great has been the public's acceptance of this train that its capacity is being increased from 72 passengers to 112 passengers by the addition of a fourth car now under construction. Operating figures for the Union Pacific's M-10001 are not available. Nevertheless, on its initial coast-to-coast run, the operating cost of this train for fuel amounted to only 2.44 cents per train mile. Thus do Winton-Diesel engines flash across the frontier of power achievement . . . embodying new engineering advances that are now being most effectively expressed in reduced operating cost.



The new Union Pacific M-10001, powered by a twelve-cylinder, V-type, two-cycle, 900 h. p. Winton-Diesel engine, attained a maximum speed of 120 m.p.h. and set the record for the fastest run by a railroad train from Los Angeles to New York, 3260 miles in 56 hours and 55 minutes.

The Burlington Zephyr, powered by an eight-cylinder, two-cycle, 600 h. p. Winton-Diesel engine, made the longest, fastest, non-stop run in railroad history . . . . 1015 miles from Denver to Chicago in 13 hours and 5 minutes, an average of 77.6 m. p. h.

WINTON ENGINE CORPORATION

CLEVELAND, OHIO, U. S. A.

Equipment and Supplies

Additional P.W.A. Loans to Railroads

An allotment of $2,500,000 made to the New York Central by the Public Works Administration last spring for purchasing and laying 37,000 tons of new rails has been increased to $3,706,000. The additional money will be used to purchase 20,000 tons of rails and 9,000 tons of fastenings. The New York Central has purchased and laid all of the rail provided for in the original allotment; spending $2,075,427 for rails and paying its track forces $424,599 in wages for laying them.

A loan of $5,785,000 made to the Great Northern for a general roadway improvement and equipment repair program has been increased to $5,865,000 because the company has found that the cost of part of the work to be done was underestimated when the original allotment was made. The increase of $80,000 is to cover the underestimate.

FREIGHT CARS

THE BARRETT COMPANY has ordered six tank cars from the American Car & Foundry Company.

THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC is asking for bids on 300 steel frame, double sheathed automobile cars, 40 ft. 6 in. long and of 40 tons' capacity, to be equipped with Evans Products Company's auto loaders for making standard load of four short and medium wheel base models of automobiles.

IRON AND STEEL

THE LOUISVILLE & NASHVILLE has ordered 15,000 tons of rails from the Tennessee Coal, Iron & Railroad Company.

AIR CONDITIONING

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC will air-condition 123 cars during 1935, the number being an increase of 20 over its original plans. Of the 123 cars, 68 are railroad-owned and 55 are Pullman-owned. Orders have been placed with the Safety Car Heating & Lighting Company for steam-jet air-conditioning equipment which is now being installed in company shops. These air-conditioned cars will be operated on the Olympian, the Arrow, the Day Express, the Pioneer Limited, the Southwest Limited, the Fast Mail and the new high-speed train between Chicago and the Twin Cities.

SIGNALING

THE BOSTON & MAINE has ordered from the General Railway Signal Company materials for searchlight signals for use between Boston and Greenfield (double-track lines, already signaled), as follows: Tyter to Montague, Mass., 15 miles; Waltham and Ayer, 21 miles, with centralized traffic control between West Concord and South Acton, the control being by means of additional levers in the machine at Waltham; Ayer and East Fitchburg, 8 miles. There will be a CTC controlled interlocking at Gardner. The order includes also rectifiers, transformers, relays and other apparatus for other locations.

THE NEW YORK CENTRAL has ordered from the General Railway Signal Company material for an 80-lever, model 5A, electric interlocking machine, to be installed at Syracuse Junction, N. Y. The order includes also color-light signals, rectifiers, an illuminated track diagram and other materials.

Supply Trade

The Hennessy Lubricator Company has reopened offices at 75 West Street, New York City.

William Bierman has been appointed assistant to the president of the **Pullman-Standard Car Manufacturing Company,** Chicago.

Ward A. Mohun, special representative in the sales department of the **Reo Motor Car Company,** has been appointed assistant sales manager and **E. W. Stephan,** who has been manager of the Philadelphia factory branch for the past two years, has been placed in charge of all Reo branches in the United States.

C. G. Landes has been appointed Loadmaster distributor for the **Bucyrus-Erie Company,** South Milwaukee, Wis., for the central portion of Ohio, with headquarters at Columbus, Ohio. The **Collier Tractor & Equipment Company** has been appointed Loadmaster distributor for the northern and western sections of Nevada, as well as the northeastern portion of California.

George McM. Godley, who has been elected president of the **Burden Iron Company,** was graduated from Massachusetts Institute of Technology in 1898, in the course of mining and metallurgical engineering. The following two years he studied metallography at the Freiberg Academy and University of Berlin, and subsequently went with the Midvale Steel & Ordnance Company, Philadelphia, Pa., helping to set up metallography laboratory. Mr. Godley was later connected with the New Jersey Zinc Company, the Warren Foundry & Machine Company, the Thomas Iron Company and from 1912 to 1920 was vice-president of the Linde Air Products Company. Following this he retired from active service and now becomes president of the Burden Iron Company, having been for a number of years a member of its board. He succeeds as president the late William E. Millhouse, of Troy, N. Y.

George McM. Godley

Carl S. Clingman, Transportation department sales manager of the Western region, of **Johns-Manville Sales Corporation,** with headquarters at Chicago, has been appointed general sales manager of the Transportation department with the same headquarters. Mr. Clingman was educated at Northwestern University, having taken a mechanical engineering course in 1904. He began work with the Pullman Company in its apprentice school, and was promoted in 1907 to assistant general shop foreman at the Pullman, Ill., works. The following year he was transferred to Wilmington, Del., as eastern mechanical inspector. In 1910 he returned to the Pullman Ill. works as mechanical inspector, and the following year was promoted to general mechanical inspector with office at Chicago. He entered the service of Johns-Manville in 1917, as sales representative in the southwest, and for the past year has been serving as Transportation department sales manager of the western region, with headquarters at Chicago. Mr. Clingman will continue to have direct responsibility for the western region in addition to his other duties.

Carl S. Clingman

OBITUARY

W. Morgan Hood, sales representative of The Lunkenheimer Company, Cincinnati, Ohio, died at Roanoke, Va., on January 9 as the result of an automobile accident. Mr. Hood was well-known throughout the southeastern states, having traveled that territory for the Lunkenheimer Company for more than 20 years. He was 67 years old and had his headquarters at Washington, D. C.

Construction

Mexican Government Considering Construction Program

The Mexican government has under consideration a proposal for a six-year plan of railroad construction and rehabilitation, the first step of which, as outlined in a plan sent to the House of Representatives by President Cardenas, would involve the appropriation of sixty million pesos for the construction of several new lines. The bill provides for the constitution of a private company to be known as the Railway Lines of Mexico to construct the new lines and to take over certain existing lines. Two-thirds of the stock in the new company would be held by the government and the remainder would be available for purchase by individuals. The board of directors would consist of five members, three of whom would be appointed by the government and two by the stockholders.

Under the plan new lines would be constructed between Santa Lucrecia, Ver. C., and Campeche, Cam.; Oaxaca, Oax., and Puerto Angel; and between Durango, Dgo., and Mazatlan, Sin. Existing lines involved in the new setup would be the Nacional de Tchuantepec, which connects the Gulf of Mexico, at Puerto Mexico, with the Pacific Ocean at Salina Cruz, Oax.; the line between Juile, Ver. C., and San Juan Evangelista; and the line extending between Vera Cruz and Alvarado, Michoacan.

New Coal Pier for N. & W.

The Norfolk & Western has let contracts and work is actively progressing on a new low-level lake type coal pier at its tidewater coal terminals, Lambert Point, Va. The new pier will cost about $1,600,000; it will be 1,000 ft. long and will accommodate the largest vessel now taking coal on the Atlantic Coast. The equipment is designed to work automatically in many respects and will have a dumping capacity of 50 cars of coal an hour.

Retarding devices on the coal dumper and pan will prevent the rapid flow of coal, together with the telescopic chute, will provide speedy operation, eliminate clear falls from cars into vessels and prevent breakage of prepared sixes of coal. The end of the telescopic chute will be equipped with an independent-acting double, undercut gate which can place the coal in any part of the hatch desired.

The company's gravity yards and scales at its piers at Lambert Point also will serve the new pier. Car retarders will be used on both the approach track to the coal dumper and the empty return track to the yard. The dumper will be equipped with the latest type electric machinery and the mechanical "mule" haulage system. It also will be equipped with a sprinkler system for sprinkling coal when required.

The slip next to the dumper is being dredged to a depth of 38 ft. The fender system of the pier will be of creosoted piles and timber, while the trestle supporting the tracks—both on the pier and on land—will be of steel construction. The project will require approximately 450,000 cu. yd. of dredging, 4,500 piles in foundation and fender system, 14,000 yd. of concrete, and 2,200 tons of structural steel.

CHESAPEAKE & OHIO.—Contracts have been awarded to the Ogle Construction Company, Chicago, for the construction of a 75-ton reinforced concrete automatic electric coaling station at Ronceverte, W. Va., and for the installation of a reinforced concrete automatic electrically-operated, skip-hoist, direct engine coaler at Cane Fork, W. Va.

DELAWARE, LACKAWANNA & WESTERN.—Modern facilities for the handling of anthracite and bituminous coal at Oswego, N. Y., are being constructed by this road. A contract has been given to the R. W. Kaltenback Corporation, Bedford, Ohio, and it is expected that the new equipment will be ready for operation early in May. An endless conveyor for handling coal directly from cars into vessels will supplant the trestle erected in 1882. The improvement involves the construction of a track hopper of two-car capacity into which the coal will flow from the railroad cars on to the endless conveyor, which will deposit the fuel in vessels by means of a telescopic chute equipped with an automatic trimming device. The equipment will have a capacity of 800 tons an hour.

Financial

CHESAPEAKE BEACH.—*Abandonment.*—The receiver has applied to the Interstate Commerce Commission for authority to abandon this company's line from Seat Pleasant, Md., to Chesapeake Beach, 26 miles.

INTERSTATE.—*Equipment Trust Certificates.*—The Reconstruction Finance Corporation has offered for sale on bids to be received January 30, $250,000 of equipment trust certificates issued by this company to the Public Works Administration.

PENNSYLVANIA.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for a modification of the orders under which it authorized the expenditure of $17,000,000 for the construction of 7,000 freight cars, under a loan from the Public Works Administration and the issuance of that amount of equipment trust certificates. The company desires to equip 500 of the cars with auto loaders and also to issue definitive certificates to the amount of approximately $15,525,000, which had been advanced by the P.W.A., in place of temporary certificates. The P.W.A. wishes to sell the certificates but the amount will be somewhat less than $15,525,000 as the result of a final accounting now in progress.

Dividends Declared

Boston & Providence.—$2.125, quarterly, payable April 1 to holders of record March 20.

Cleveland & Pittsburgh.—7 Per Cent Guaranteed, $0.87½, quarterly; Special Guaranteed, $0.50, quarterly, both payable March 1 to holders of record February 9.

Louisville & Nashville.—$1.50, semi-annually, payable February 25 to holders of record January 31.

Mine Hill & Schuylkill Haven.—$1.25, semi-annually, payable February 1 to holders of record January 15.

New Haven & Shore Line.—$0.25, payable February 1 to holders of record January 20.

Norfolk & Western.—$2.00, quarterly; Extra, $2.00, both payable March 19 to holders of record February 28.

Oswego & Syracuse.—$2.25, semi-annually, payable February 20 to holders of record February 6.

Passaic & Delaware.—$1.25, semi-annually, payable February 1 to holders of record January 25.

Pennsylvania.—$0.50, payable March 15 to holders of record February 15.

Syracuse, Binghamton & New York.—$3.00, payable February 1 to holders of record January 25.

Average Prices of Stocks and of Bonds

	Jan. 22	Last week	Last year
Average price of 20 representative railway stocks..	34.84	33.45	45.79
Average price of 20 representative railway bonds..	76.18	75.90	73.81

Railway Officers

EXECUTIVE

John Junell, a Minneapolis attorney, who has been appointed co-receiver of the Minneapolis & St. Louis, as noted in the *Railway Age* of January 19, was born on May 10, 1886, at Indiana, Michigan. He attained his legal education at the University of Michigan and has been a practicing attorney at Minneapolis, Minn., since May, 1911, except for a period during the

John Junell

World War when he was in military service. During his career, Mr. Junell has represented small industrial lines and one belt line and has served the Chicago Great Western as Minnesota attorney. He is a member of the law firm of Junell, Driscoll, Fletcher, Dorsey & Barker, Minneapolis.

L. C. Sprague, who has been appointed co-receiver of the Minneapolis & St. Louis, as noted in the *Railway Age* of January 19, was born on September 29, 1885, at Serena, Ill., and received his education at night school and through the International Correspondence Schools. He entered railway service with the Chicago,

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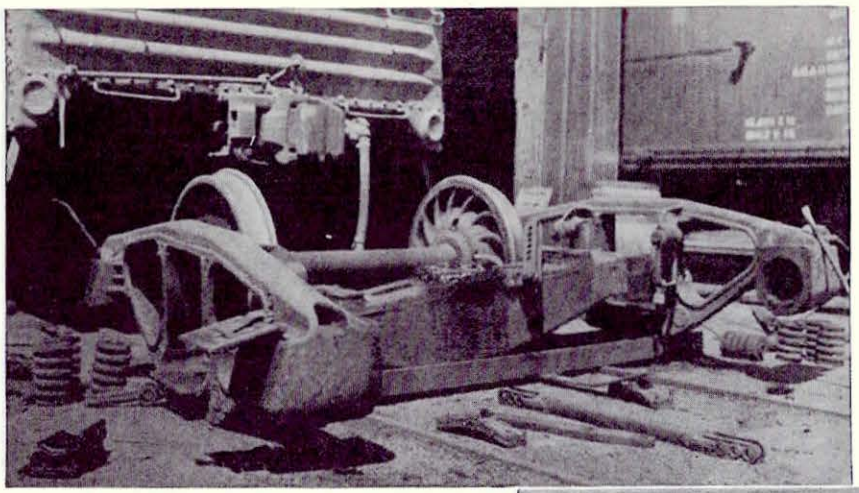
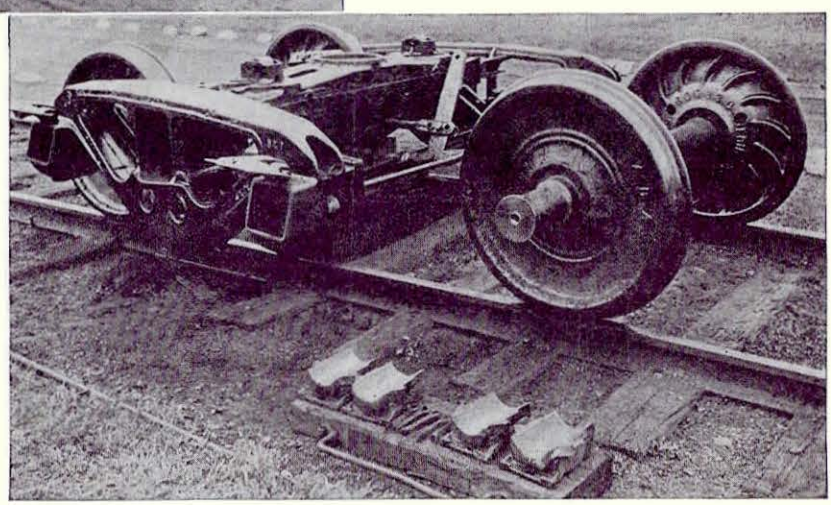
Wheel Changing Made Easy



Actual photograph taken during a typical wheel change.

NATIONAL
Type B Truck
***Quick* Wheel Change**



With the National Type B Truck, changing wheels is reduced to a simple inexpensive operation, requiring but a short time, and few tools.

Just jack up the bolster, remove the bearing brasses, wedges and brake hanger pins; spread the frame ends, and roll out the wheels.

No spring plank or separate brake beam safety devices to handle.

Brake rigging and spring assemblies are left intact.

Time out of service is reduced to the minimum.

NATIONAL MALLEABLE AND STEEL CASTINGS CO.

General Office—Cleveland, O.

Sales Offices: New York, Philadelphia, Chicago, St. Louis, San Francisco
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

Burlington & Quincy in 1899, and was connected with this road until 1910, serving successively as a call boy, operator, fireman and engineman. During the next two years he served as mechanical and airbrake instructor with the International Correspondence Schools. In 1912 he went with the Great Northern as supervisor of airbrakes and three years later he became general motive power inspector with the Baltimore & Ohio. From 1918 to 1920, Mr. Sprague was engaged as sales manager with the Chicago Pneumatic Tool Company, then entering in the building business. He returned to railroad service in 1923 as superintendent of the Uintah Railway, subsequently serving successively as general manager and vice-president. From 1929 to 1931 he was connected with the Dardelet Company as vice-president and in the latter year he was appointed consulting engineer for the Wichita Northwestern. In the following year he was appointed executive representative of the Missouri-Kansas-Texas, which position he

L. C. Sprague

was holding, with headquarters at Washington, D. C., at the time of his recent appointment as co-receiver of the M. & St. L. Mr. Sprague has also served as consulting engineer for the Carrier Holding Corporation and for the Louisiana Southern.

George T. Atkins, vice-president in charge of traffic of the Missouri-Kansas-Texas, who has been promoted to executive vice-president, as noted in the *Railway Age* for January 19, was born on August 13, 1878, at Petersburg, Va. He entered railway service in 1897, as a messenger in the office of the auditor of the Texas & Pacific at Dallas, Tex. In the following year Mr. Atkins went with the Missouri-Kansas-Texas of Texas, where he served in various clerical positions in the auditor's office at Dallas, until 1901, when he was appointed file clerk in the same office. He then served successively as rate clerk and chief rate clerk in the same office until 1906, when he was made commercial agent for the Katy at Dallas. Later in the same year he returned to the general freight office as chief clerk, holding this position until 1910 when he resigned to become freight traffic manager of the Shreveport (La.) Chamber of Commerce. Under government control of the railroads during the World War, Mr. Atkins served as traffic assistant in the division of public service and accounting of the United States Railroad Administration, later holding the

George T. Atkins

position of assistant director of the division of public service of the U.S.R.A. He returned to the Katy in 1920 as freight traffic manager of the system, holding this position until 1926, when he was elected vice-president in charge of traffic, with headquarters at St. Louis.

Joseph F. Garvin, freight traffic manager of the Missouri-Kansas-Texas of Texas, who has been appointed vice-president in charge of traffic of the Katy, with headquarters at St. Louis, Mo., as noted in the *Railway Age* of December 19, was born on October 6, 1878, at St. Louis, Mo. Mr. Garvin first entered railway service in 1893 as a messenger with the Missouri Pacific. In the following year he was made clerk to the general manager at St. Louis, and during the next two years he served as clerk and stenographer to the general superintendent at the same point. In 1896 Mr. Garvin entered the service of the Katy as a stenographer in the freight traffic department at St. Louis, returning to the Missouri Pacific as a clerk to the general superintendent at the same point two years later. In 1899 he went back to the Katy as secretary to the vice-president and traffic manager, holding this position until 1902, when he was promoted

Joseph F. Garvin

to chief clerk to the vice-president and traffic manager. In 1908 Mr. Garvin was further advanced to chief clerk in the freight traffic department at St. Louis, being appointed assistant general freight agent on the Missouri-Kansas-Texas at Dallas, Tex., in 1911. In 1914 he was made general freight agent at the same point and in 1926 he was further promoted to assistant freight traffic manager with the same headquarters. In 1927 Mr. Garvin was appointed freight traffic manager of the Katy lines at St. Louis. In 1931, when the position of freight traffic manager of the Katy lines in Texas was created, Mr. Garvin was appointed to that position with headquarters at Dallas, continuing to hold it until his recent promotion.

OPERATING

The jurisdictions of **D. E. Beatty** and **W. M. Boykin,** superintendent and assistant superintendent, respectively, of the Pensacola division of the Louisville & Nashville at Pensacola, Fla., have been extended to include the Montgomery and New Orleans division. Their new headquarters will be at Mobile, Ala.

TRAFFIC

S. D. Sparkes, general freight agent of the Missouri-Kansas-Texas of Texas, with headquarters at Dallas, Tex., has been promoted to freight traffic manager with the same headquarters, succeeding **Joseph F. Garvin,** who has been appointed vice-president in charge of traffic at St. Louis, Mo. **R. T. DuBose,** assistant general freight agent at Dallas, has been promoted to general freight agent to succeed Mr. Sparkes, and the position of assistant general freight agent has been abolished.

ENGINEERING AND SIGNALING

R. C. Dunlay, a roadmaster on the Missouri-Kansas-Texas, with headquarters at Parsons, Kan., has been promoted to district engineer with the same headquarters, succeeding **W. W. Marshall,** who has been appointed roadmaster-switch inspector for the system.

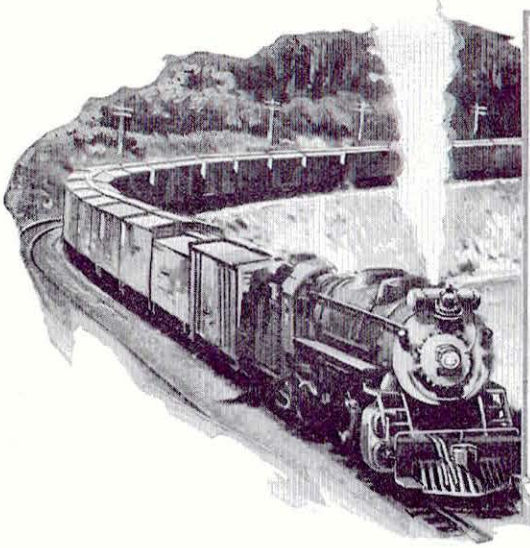
MECHANICAL

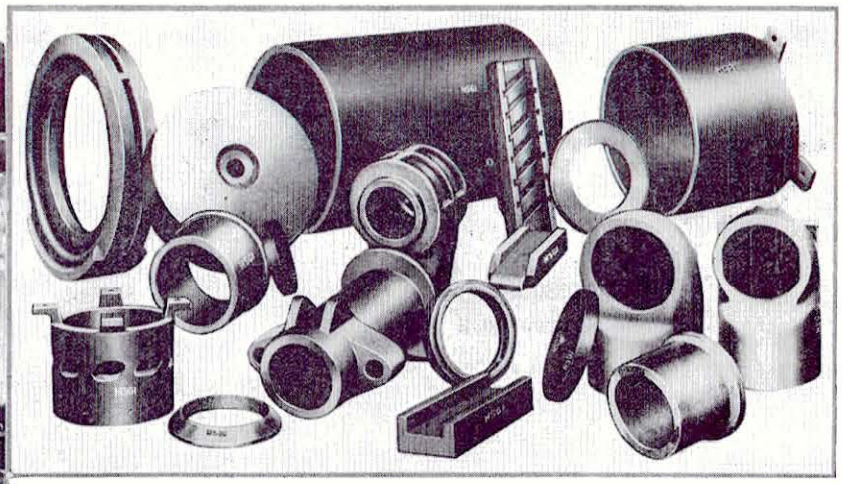
J. L. Carver, engineer of tests of the Illinois Central, with headquarters at Paducah, Ky., has been promoted to mechanical engineer, with headquarters at Chicago, succeeding **William O. Moody,** whose death on December 25 was noted in the *Railway Age* of December 29.

OBITUARY

Hal B. Fullerton, retired agricultural director of the Long Island, died on January 11 in a hospital at Patchogue, L. I. Mr. Fullerton, who retired eight years ago, was in his seventy-ninth year.

A. M. Clough, retired supervisor of track on the New York Central, died at his home in Batavia, N. Y., on January 10 after an illness of three months. Mr. Clough was a former president of the Roadmasters' and Maintenance of Way Association.





1935 STATISTICS

WILL SHOW BIG IMPROVEMENT

LOCOMOTIVE performance records will show greater efficiency, lower fuel consumption, fewer failures and lower maintenance costs.

Stores department records will contain fewer requisitions for materials.

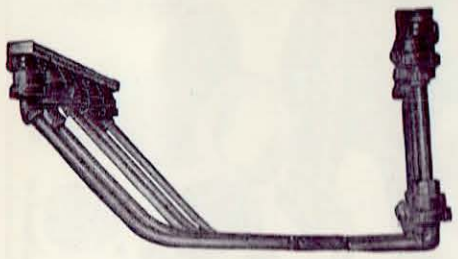
Shop records will show greater mileage between renewals of locomotive parts and lower machining costs.

Operating expenses will be lower and earnings will increase. Statistics for this year will show a big improvement—if your road will standardize on all of the HSGI Wearing Parts listed below.

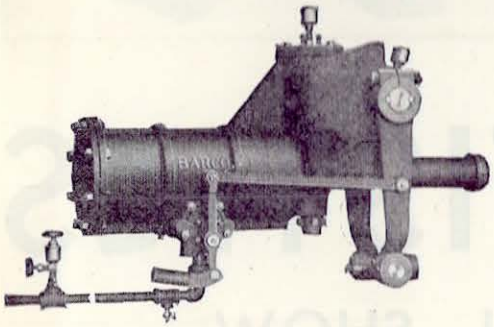
HSGI
Reg. U. S. Trade Mark
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings
Parts Finished For Application
Dunbar Sectional Type Packing
Duplex Sectional Type Packing for Cylinders and Valves
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

HUNT-SPILLER MFG. CORPORATION
J.G. Platt, Pres. & Gen. Mgr. V.W. Ellet, Vice-President
Office & Works
383 Dorchester Ave. South Boston, 27, Mass.
Canadian Representative: Joseph Robb & Co., Ltd., 70 North Bank Rd., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

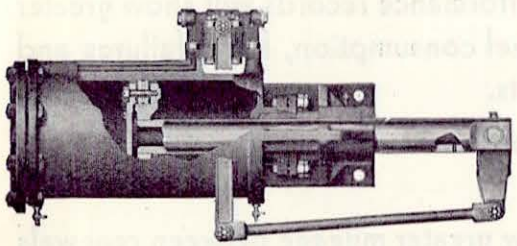
Air Furnace HUNT-SPILLER GUN IRON



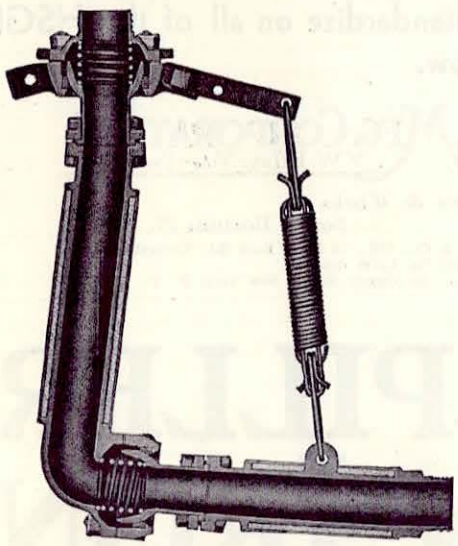
BARCO 3V Engine Tender connections eliminate failures and delays.



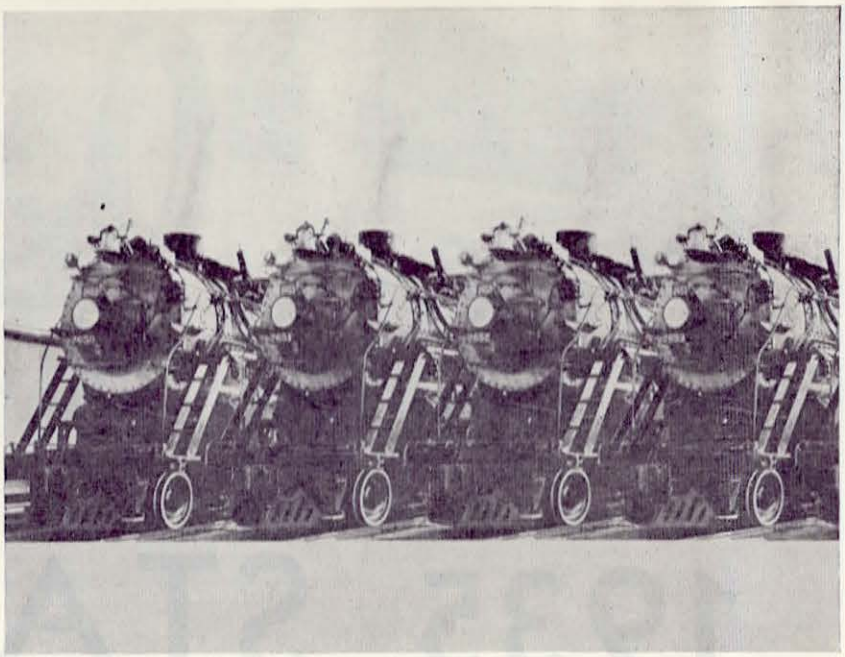
BARCO type B-4 positive lock Power Reverse Gears save fuel and increase locomotive efficiency.



BARCO M-1 balanced pressure Power Reverse Gears save fuel and increase locomotive efficiency.



BARCO Metallic Steam Heat connections are one of the outstanding factors contributing to the efficiency, economy and comforts of passenger train heating.



APPLICATION ON M REFLECTS IMPORTANC

EQUIPMENT statistics for 1934 will show that BARCO Devices were applied on the majority of the locomotives and passenger cars ordered during the year.

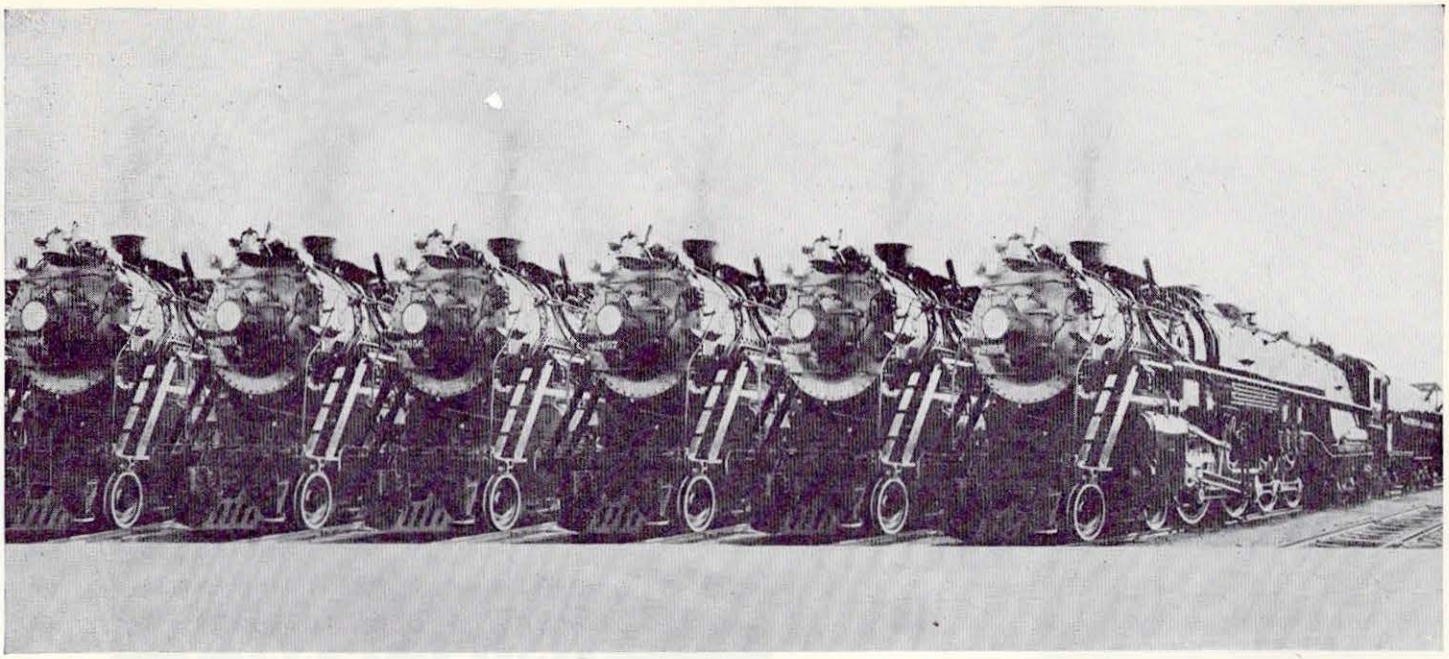
It is obvious that this endorsement must be based on the dependability of BARCO Devices and their contributions to the economy of safety and of operation.

BARCO 3V engine and tender connections are standard for air, oil and steam on the majority of the large leading railroads. They provide the most reliable service at minimum cost and with minimum attention.

BARCO Power Reverse Gears contribute a new efficiency to locomotive operation. They insure closest adjustment and accurate cut-off at the lowest maintenance cost.

BARCO Metallic Steam Heat Connections on the rear of tenders and between passenger cars are more than meeting the requirements of efficient and economical heating of passenger equipment. Constantly increasing applications prove their superiority.

BARCO



ODERN EQUIPMENT E OF BARCO DEVICES

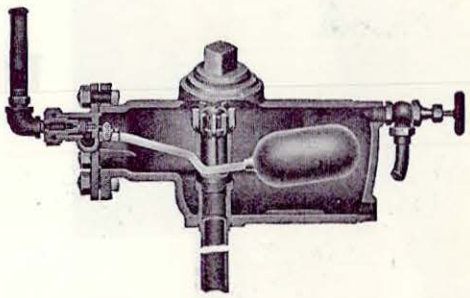
The above illustration shows ten of the most modern and powerful 4-8-4 type locomotives ever constructed. This new motive power represents an investment of $1,220,000.00.

BARCO Low Water Alarms are guarding this investment against crown sheet failures, boiler explosions and expensive maintenance caused by high water levels.

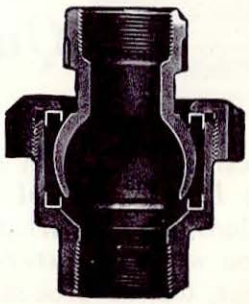
Many of the other locomotives ordered this year are also equipped with BARCO Low Water Alarms. Railroads have discovered that these dependable sentinels pay big returns while guarding lives and property.

Your railroad completely equipped with BARCO Devices will save you thousands of dollars annually in the maintenance of equipment, engine terminals, shops, coach yards and stations.

Barco Manufacturing Co.
1801 Winnemac Avenue, Chicago, Illinois
THE HOLDEN CO., LTD.
In Canada
Montreal—Moncton—Toronto
In Canada
Winnipeg—Vancouver

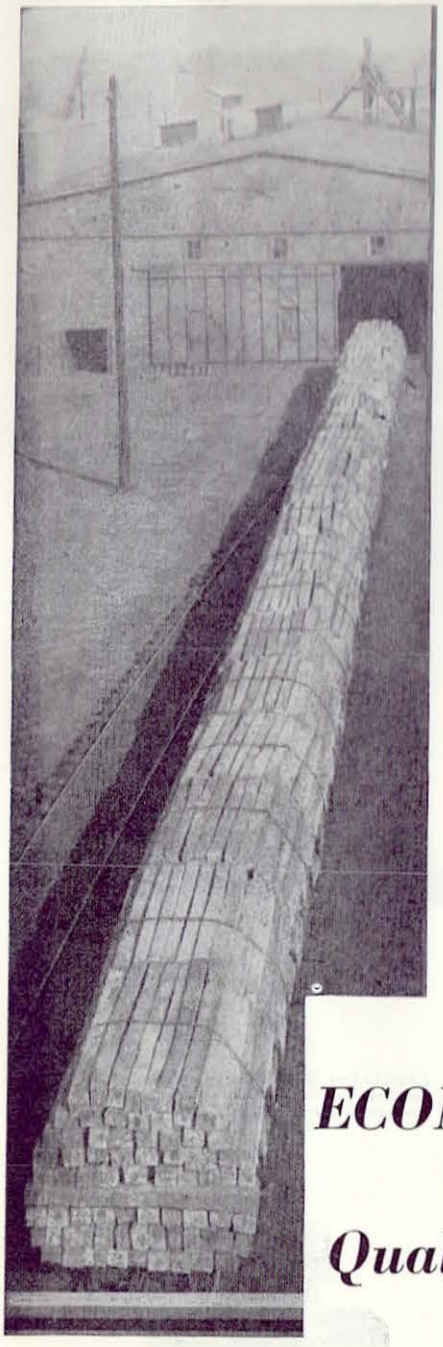


BARCO Low Water Alarm guards against disastrous boiler explosions and costly renewals of burned crown sheets.



BARCO Flexible Joints are saving thousands of dollars annually by eliminating leaks and reducing replacements on locomotives and cars, and in engine terminals, shops and coach yards.

PRODUCTS



QUALITY IN PRODUCTION *and* TREATMENT

ECONOMIZE with Quality Ties

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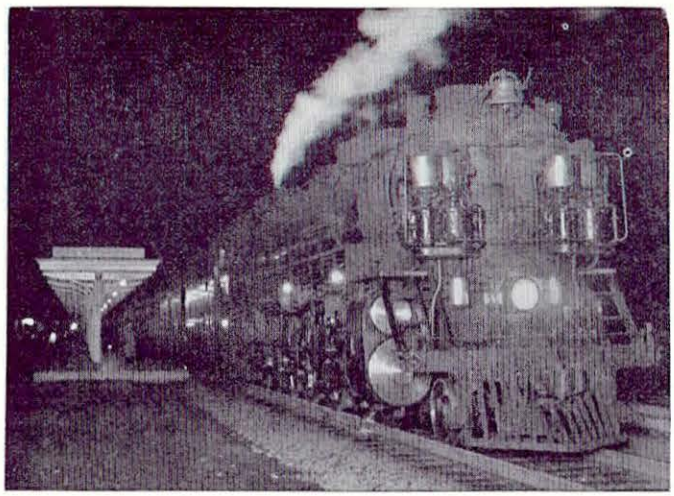

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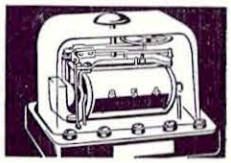

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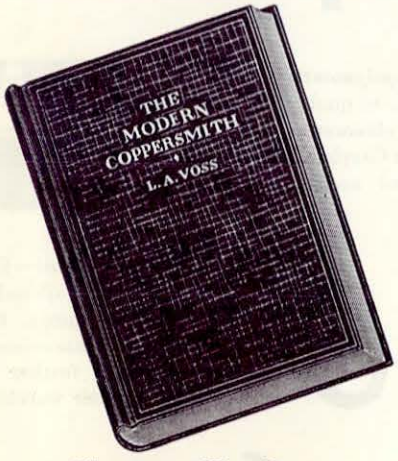

Chapter Headings

Introductory; Sheets, Tubes, Solders, Flux; Tools and Fixtures; Joining; Copper Riveting; Sheet Seaming and Brazing; Varnish Kettle; Jacket Kettle; Dome Shaped Tops; Expansion Joints; Cone Shaped Air Chamber; Bends; Ship Ventilator; Sheet Forming and Finishing; Pipe Connections; Pipe Fitting; Copper Pipe Unions; Cup Joints; Branches; Pipe Reducing; Pipe Bending; Jacketed Pipe; Assembled and Finished Work; Working Various Metals.

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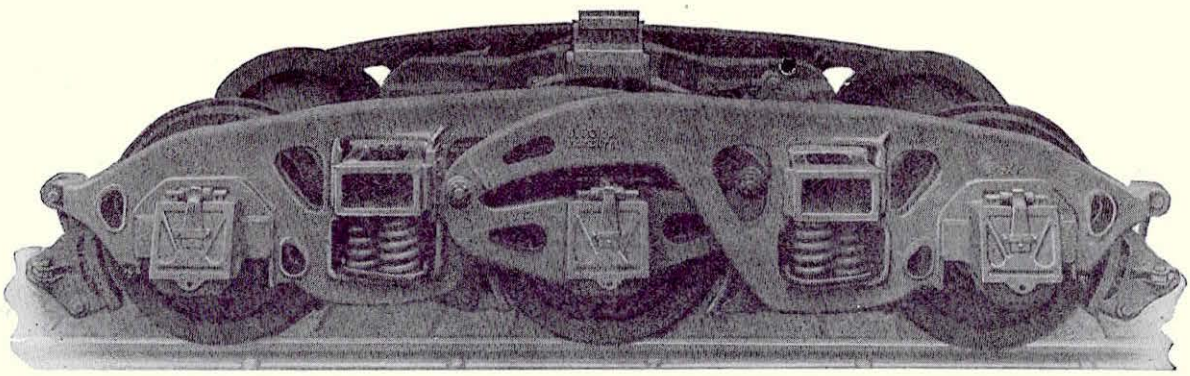

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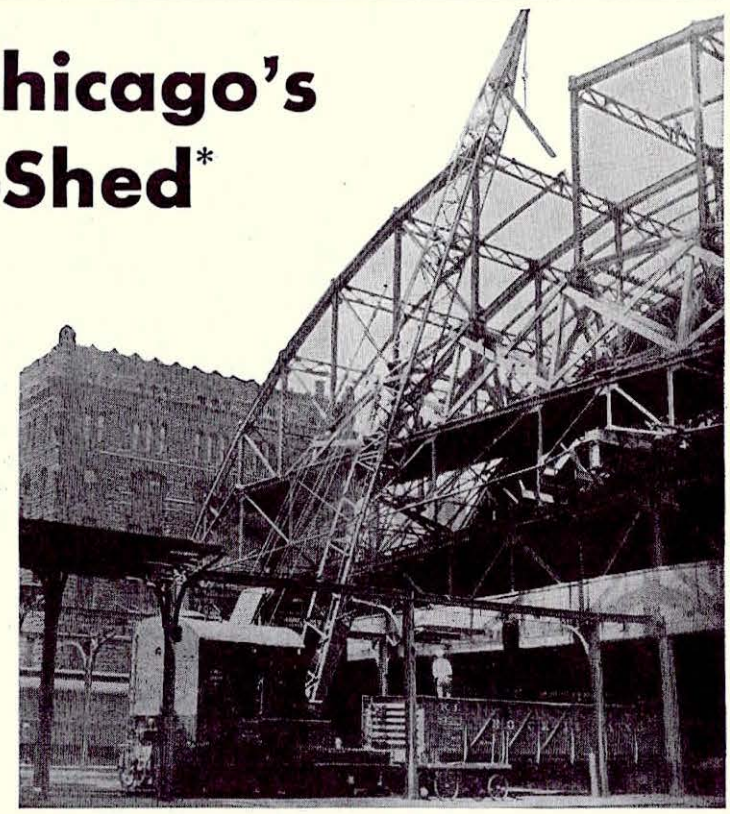
*Described in Nov. 17th Railway Age and December 20th Engineering News Record



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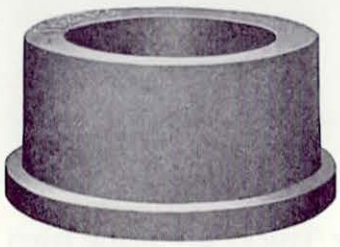

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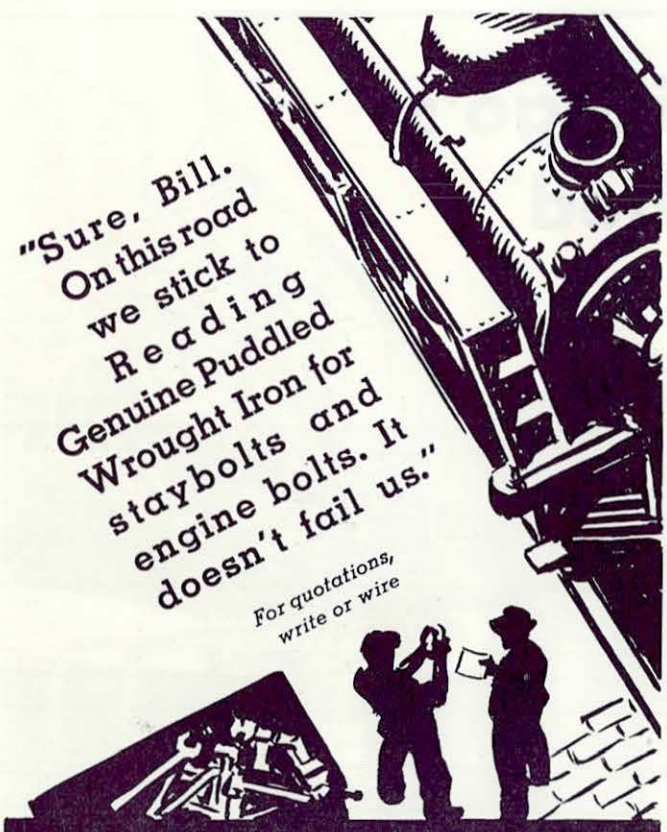

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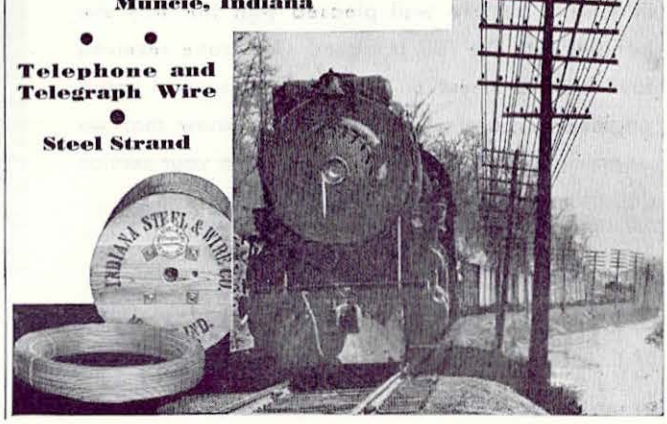

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are the answer

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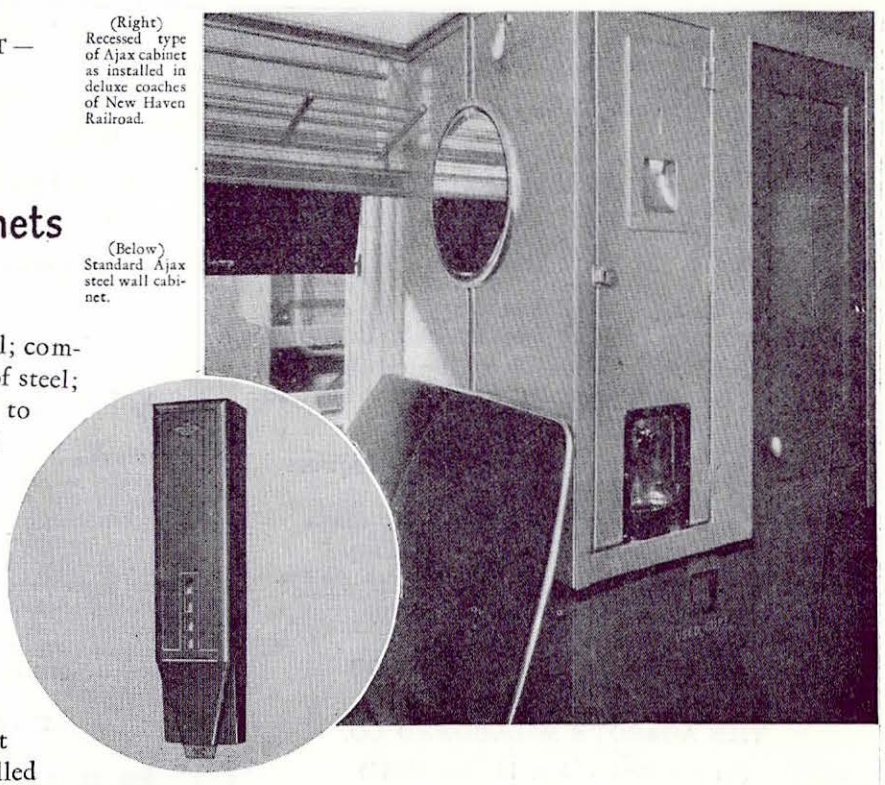

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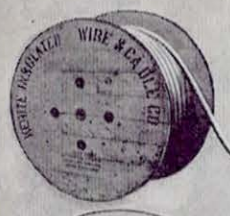

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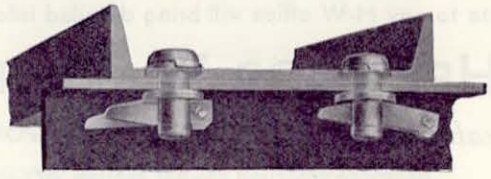

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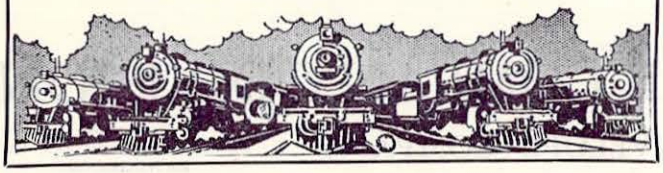

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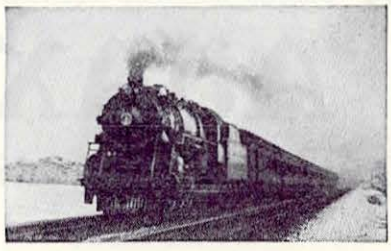

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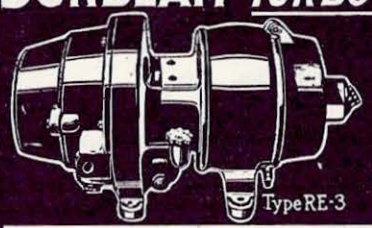

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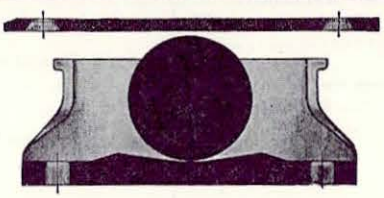

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R. W. BIXBY, Inc.
102 Delward Bldg., Buffalo, N. Y.

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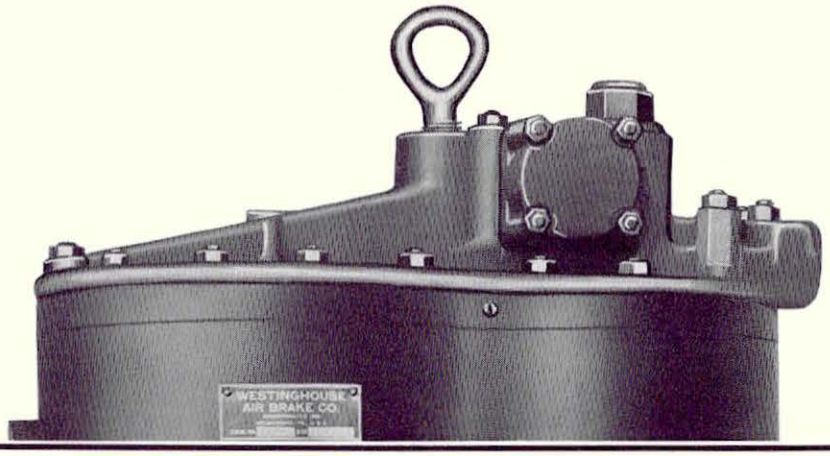

Improved TOP HEAD for Air Compressors

IMPROVED top head for the 8-½" Cross Compound Compressor, furnished with all new machines, and has advantages that warrant its substitution for old heads now in service.

Its outstanding advantages are:

Live Steam Pipe is connected to the top head instead of the cylinder body — thus eliminating a source of gasket trouble.

Reversing Valve is of the Piston Valve type, having minimum frictional resistance, which reduces strain on the reversing rod, assures positive action, and consequently better compressor performance.

Main Valve is of the Unit type (instead of segmental), which insures maintenance of alignment, simplifies assembly, and facilitates repairs.

Complete description is given in Circular Notice 1105, a copy of which may be had for the asking.

WESTINGHOUSE AIR BRAKE CO.

GENERAL OFFICE AND WORKS

WILMERDING, PA.

(1278)

Prospective Expenditures —Signaling

Expenditures for new facilities and for taking up deferred maintenance will aid roads in speeding up trains

"New developments in signaling facilities offer a fertile field for capital expenditures that will afford large returns in the form of operating economies or greater expedition in the movement of traffic. The operation of trains by signal indication, with power-operated passing-track switches, will reduce delays on the road, while car retarders with power switches will expedite the classification of cars in yards. Increased track capacity and higher average train speeds can be obtained more economically by installing such signal facilities than by any other means. Appropriations for such improvements, amounting to at least $20,000,000 annually over a five-year period, will yield large returns, while an annual outlay of $10,000,000 is needed to make good the accrued deficiencies in signal maintenance."*

* *Railway Age, Dec. 1, 1934*

UNION SWITCH & SIGNAL COMPANY
Swissvale, Pennsylvania

GENERAL RAILWAY SIGNAL COMPANY
Rochester, N. Y.

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HISTORY IN THE MAKING

In 1929 the Class I railways spent $35,140,858 for maintenance of signals and interlockers, while in 1932 this expense dropped to $14,536,418.